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FOREWORD

The *United States Armed Forces Medical Journal* is the medium for disseminating information of administrative and professional interest to all medical personnel of the Department of Defense. The Assistant Secretary of Defense (Health and Medical) and the Surgeons General of the several services invite all medical officers, dental officers, Medical Service Corps officers, Nurse Corps officers, and officers of the Veterinary Corps of the Armed Forces, and the medical consultants of the Army, Navy, and Air Force to submit manuscripts for publication in this *Journal.*

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Monthly Message

Dr. Willard C. Rappleye in an address at the Congress on Medical Education and Licensure, 1954, narrated the history of medical licensure:

> Roger II of Sicily issued an edict in 1140 forbidding anyone to practice medicine who had not passed the necessary examinations. The Fourth Lateran Council in 1215 issued additional rules in regard to surgical procedures. Frederick II in 1224 extended the regulations promulgated by Roger II and even specified that the medical faculty of the University of Salerno should conduct the necessary professional tests. The educational component of medical training was clearly stated even at that time when it was specified that a candidate must have studied philosophy for three years, medicine for five years and to have practiced under a qualified physician for one year. Please note that those educational conditions were laid down 700 years ago.

Since then much effort has been expended in raising the quality of medicine. In 1307 the King of France established a board of surgery in Paris to examine and certify those who wished to practice surgery. Following this, numerous royal proclamations were issued dealing with surgery. In England both the university and barber-surgeons had their own boards, which were eventually merged under the great charter granted by Henry VIII. This, however, was not altogether a happy marriage and for the next 200 years until the establishment of the Royal College of Surgeons in the eighteenth century, there were still many disputes between the guilds.

In our own country the past 50 years have seen the abolition of the diploma mills and the steady elevation and quality in the practice of medicine and surgery. We must guard against overspecialization, however, and a return to the outmoded guild system toward which some of the specialty boards seem to lean. In the words of Santayana, "Those who cannot remember the past are doomed to repeat it."

Frank B. Berry

FRANK B. BERRY, M. D.
Assistant Secretary of Defense
(Health and Medical)

UNDERSTANDING THE "FEAR OF FLYING" SYNDROME

I. Psychic Aspects of the Problem

LUCIO E. GATTO, *Colonel, USAF (MC)*

WHILE "fear of flying" is only one of the many problems encountered in providing a competent air arm, its presence in a command or an organization is often the cause of great concern and confusion to both commanders and medical officers. When skilled aircrew members who have been trained at great expense refuse to fly, they cannot lightly be excused permanently from their duties. Nor can commanders unconcernedly obligate disturbed men to return to flying when it means entrusting them with the lives of others and with the complex, costly aircraft of this military era. This problem frequently leads to great indecision as to what action is proper to remedy the difficulties.

ANALYSIS AND DEFINITION

Because "fear of flying" is a complex problem with many ramifications, it behooves all who deal with it to attain as comprehensive an understanding of its nature as possible so that suitable decisions can be made. While most Air Force commanders and aviation medical officers realistically accept such tangible aviation problems as oxygen lack, the effect of gravitational force, supersonic speeds, and radical temperature changes, they frequently become perplexed and mystified when men presenting behavior disturbances fail to respond to authoritative exhortation or logical reasoning, and seem unable to exercise any will power. Although the medical officer may be aware of the presence of strong emotional forces in these problems, he is usually not aware of the effect or meaning of such forces because they frequently remain illusive and intangible.

EFFECT OF EMOTIONAL CONFLICTS ON FLYING EFFECTIVENESS. Because emotional disturbances can impair the effectiveness of flying personnel, it is important to recognize that a *psychic emotional homeostasis* is just as essential to men in military aviation as is the physical homeostasis provided by all the protective apparatus and devices that aeronautical and aviation

From Headquarters, Far East Air Forces. Col. Gatto is now assigned to U. S. Air Force Hospital, Sampson Air Force Base, N. Y.

medical research has developed. Very often, valuable flying personnel may be lost more easily through the failure of the flier's "psychic armor" than through that of his "physical armor." Too often the effect of emotional forces is disregarded when its recognition and relief would prevent the impairment of flying effectiveness. To deny the existence or the disastrous influence of such forces is as serious as to deny the insidiously harmful, destructive effect of infectious bacteria because they, too, may be invisible. These unseen forces may be just as destructive to psychic life as is a rapidly revolving, invisible airplane propellor to the physical life of anyone stepping into the path of its violent but unseen motion.

Despite the highly specialized selection of flying cadets and the toughening cadet training process that flying personnel undergo, they in no sense become immune to physical and emotional stress. Each one still may have his own specific physical or emotional vulnerability. For no matter what one may believe, pilots are ordinary people; as human beings they can be expected, at some time or another in the natural course of their lives, to develop physical or emotional illnesses. One might state unequivocally that they are entitled to their proportionate share of such illnesses.

Our experiences with the flying personnel of the Far East Air Forces indicate clearly that if the total Air Force mission of maintaining flying personnel in constant and effective flying readiness is to be successful, harmful emotional disturbances must be uncovered and eliminated early enough to prevent such undesirable reactions as "fear of flying." For when the emotional problems that lead to a "fear of flying" syndrome remain unrecognized, many flying personnel are grounded permanently, either medically or administratively, when they might have been made effective again.

Role of preventive aviation psychiatry. The use of a combined medical, psychiatric, and administrative approach to the "fear of flying" problem has been successful in the Far East in reducing the loss of many men who might have been involved seriously with a "fear of flying" problem.

In this area of emotional disturbances preventive aviation psychiatry, conducted by well-trained psychiatrists who possess a well-grounded knowledge of Air Force life and problems, has just as important a role in aviation as has preventive technologic aviation medicine in other aspects. Clinical experiences and psychiatric research on flying personnel, as indicated elsewhere,[1-3] makes clear that preventive aviation psychiatry can deal early and adequately with the problem through recognition, investigation, evaluation, and treatment of the various emotional

disturbances which may appear among flying personnel; if neglected, they may either lead flying personnel into disabling behavior, or cause them to give up their flying duties forever. Preventive aviation psychiatry is capable of playing an active role in maintaining flying personnel at that highly efficient level of functioning necessary for the proper and superior accomplishment of the Air Force mission.

Not only must the appropriate design of aircraft and equipment to permit "full faculty performance by the aircrew" and to prevent "limitations or * * * marginal human performance"[4] be the goal of aviation research, but also a concomitant, stable "psychic armor" must constantly be available to protect the military flier from the harmful effects of unwholesome emotional forces which may also prevent "full faculty" performance and seriously impair flying effectiveness.

Combined approach to the problem. For these reasons the "fear of flying" problem will be approached from a combined medical, administrative, and psychiatric viewpoint so that a practical, workable guide, allowing suitable decisions based on real knowledge, will be available to medical officers and other interested persons in pursuing the investigation and evaluation of those affected by it. Only pertinent details are presented, rather than a comprehensive review of the entire problem. A more thorough psychodynamic discussion of deeper psychosexual and aggressive drives, usually implicit in the problems, behavior, and attitudes of these men, is available elsewhere.[1-3]

While the number of men who give up flying for this reason is relatively small in comparison to the number who continue to fly, newspaper accounts at times have magnified the problem in the eyes of the public. The connotations of the phrase "fear of flying" certainly may have played a deleterious role in any program aimed at inspiring the youth of America to seek a career in military aviation[5] by justifying their fantasies concerning its dangers.

CLUES TO THE "FEAR OF FLYING" SYNDROME. Clues leading to a better understanding of this problem are found in the following statement submitted by a highly regarded and very capable officer who insisted on being grounded because of an "uncontrollable fear of flying," even though he had not undergone any personal life-threatening experiences of physical impairment. Its importance is such that it is given here as presented in an earlier article, with some enlargement and revision of the discussion.[5] He stated:

The reason for the submission of this resignation is that I have a definite "fear of flying." My fear of flying is comparable to the fear

I would have if I were being forced to watch a truck drive down the street and crush one of my children. It is a fear that a person has when he knows a horrible death stalks or awaits him. It is a fear that causes me to lose all the good common sense that I possess. It too is a fear that is difficult for me to admit to anyone; nevertheless, it is a positive fear and I am forced to swallow my pride and make this admission. I am not a coward. I believe that I am mentally in a position to understand my fear. I feel that I know what I can accomplish as well as what I cannot accomplish. I feel that I cannot satisfactorily accomplish any duties that will involve flying. I feel that if the Air Force insists that I fly it will only cause me to become so mentally ill that they will soon be forced to relieve me of my flying duties, and because I will be of no value to them in this condition, eventually release me from the service. Being mentally ill, I can be of no value to my country as a serviceman, nor of value to myself, my family, or my country as a citizen.

Due to my having this uncontrollable fear of duties involving flying, I also ask that I be grounded and relieved of any flying duties, pending the outcome of this request.

What reaction occurred in this pilot to create such a drastic change in his attitude toward flying, when previously he had shown no overt dislike for or difficulty in his flying duties? Was it just the basic fear of being maimed, multilated, or killed by falling through space and being smashed against the earth with devastating force? If it were, why had he been able to fly so competently in the past? Was he really incapacitated for flying?[5] An examination of his case history reveals some interesting clues toward understanding the "fear of flying" problem.

Case 1. Phobic (?) "fear of flying." This senior pilot had been involuntarily recalled to flying after he had established himself in civilian life. He had a well paying job. He was now happy in a second marriage and had two young children. His first marriage had failed primarily because of his long separation from his wife during World War II. Despite his reluctance over returning to active military duty and a definite determination to give up flying forever at the completion of his present active duty tour, he had proved himself so capable and effective in his flying and military duties that he was assigned to the responsible positions of squadron operations, maintenance, and flying safety officer. His persistent self-application and inherent conscientiousness, which manifested itself in a high sense of self-discipline and a constant interest in the performance of his duties, won the regard of others in his unit and helped to maintain the organization's flying fitness at a high level. He was constantly concerned, however, over the lack of new replacement parts necessary to prevent failure of aircraft. He believed his repeated requests and suggestions to superior of-

ficers for improvements in maintenance and flying safety, which he believed absolutely necessary, were not sufficiently supported or heeded.

When he flew missions himself he would be "leery at the controls for fear something would go wrong." As though to verify his fears, a fatal crash occurred in which, because of his various responsibilities, he played an important reality role. He had been instrumental in causing the transfer of a B-29 pilot from his previous duty as pilot-training officer to "milk-run weather flights" because the pilots whom this flier had been training complained repeatedly of the excessively severe test-flying situations to which he would subject them. On his first weather flight following the transfer, this pilot and his entire crew were killed when a faulty engine which could not be turned off broke loose from excessive vibration and struck the body of the aircraft, causing it to crash. The accident might have been avoided if the pilot had chosen to land at a nearer base, but he had elected to try to fly the crippled aircraft to his home base.

As flying safety officer, this pilot had to investigate the fatal accident. He blamed himself openly for the part he had played as operations officer in the course of events leading to the fatality and expressed frank remorse over transferring the dead pilot into "milk-run weather flying." His feeling about the pilot was that "he was immature looking, but was more careful and thoughtful than he appeared. I made him an instructor pilot because he was very capable. However, he could not get along with his students. He would do tricks to make things happen so that the other pilots said he was not teaching, but 'being dangerous.' He was mad at me when I put him back on the milk-run, but he let me down. I did not associate with him because of his moral standards. He was rough, yet he would go out of his way to do things for his worst enemies." This pilot's inner turmoil over the failure of those in authority to harken to his ideas is disclosed in such statements as: "Command frequently acted unaware of the difficulties we had in maintenance or they didn't do anything about it. We were told to do the best with what there was available, but they didn't seem to care. In flying, maintenance is a matter of life and death." At the accident finding board, he believed they were "grinding away at him because he knew the score. Maintenance was dangerous, but he had done his best."

Comment. In discussions with him, it was evident that the combination of his ambivalent feelings toward his superiors and his overt guilt feelings in relation to the dead pilot and crew had caused him to lose faith, not only in his superiors, but also in his own attitudes. Where previously his self-discipline and his desire to conform to military rules and authority had always helped him to perform his duties energetically and effectively, he was now willing, as a new defense against his underlying anxiety, to abandon conformity and suffer the consequences.

While he had not suffered any actual harrowing experience which might have excited the normal fear of the dangers of flying, it can be seen that his emotionally charged reactions displaced themselves from their original source (his relationship with authority and with the dead pilot), to focus upon the basic "fear of flying" which, despite a lack of real interest in flying as a permanent career, he had always controlled.

BASIC UNIVERSAL "FEAR OF FLYING." The basic "fear of flying," which we must recognize as common to all of us, only serves as a focal point upon which anxieties generated from other emotional conflicts can accumulate to appear as a deceptive phobic "fear of flying." This displacement of anxiety from its original source to other objects is a common enough phenomenon, and when it reaches phobic proportions the person may choose either a harmless or a dangerous object to fear. It is easy to recognize that when the feared object or situation is harmless or unreal as, for example, an attack by mythical dragons, the anxiety must have another source, usually an internal, unrecognized emotional conflict. It is more difficult, however, to recognize that this displacement can occur when the anxiety is attached to a situation which in reality is highly dangerous, as is flying. In this pilot's case, the energies deriving from turbulent and disturbed emotions relating to others, the confused feelings about his own attitudes, and the very visible guilt that he felt over the loss of an admired but overly aggressive pilot, combined and manifested themselves deceptively through an "uncontrollable fear of flying."

This pilot's "fear of flying," though the result of his emotional conflict, was not really disabling. During the investigation he revealed himself to be a well-controlled, friendly, self-assured person with slight visible tension but no evidence of disabling anxiety or somatic disturbance. He had had no trouble in flying from his base in Japan for the evaluation. He admitted that he could still fly, but claimed that his emotional reaction to the whole situation was so great that he was willing to give up everything to avoid further flying. After his decision to terminate flying he had no further feeling of anxiety; in fact, when he submitted his resignation, even though he knew its possible punitive or stigmatizing consequences, he felt as great a sense of relief as though an oppressing burden had been lifted from him bodily. This burden of guilt, assumed because of his part in the fatal accident, might well have caused him unconsciously to fear the retribution of omnipotent, superior, or magical powers. His fear, equivalent to "being forced to watch a truck drive down the street and crush one of my children," was his foreboding of disastrous things to come which he should not challenge in any way.

On analysis, his decision to give up flying can be seen to serve two purposes: atonement for his part in the fatal crash, and separation from the service as early as possible. The unconscious attempt at self-punishment would be satisfied by the loss of his flying commission and by separation from the service under less than honorable circumstances. In turn, this separation from military service, into which he had returned only reluctantly and toward which he no longer had acceptable feelings, would be accomplished much earlier than his normal tour of duty would have allowed. That his feelings of guilt would, he believed, be expiated through separation is clear from his statement: "I would even take a dishonorable discharge, but I know and my people would know that I am not dishonorable." During psychiatric discussion, despite his ability to understand quite clearly his emotional problems relating to his "fear of flying," he elected to remain grounded. Because at the termination of his psychiatric review he showed no true anxiety relating to his flying, the problem of his disposition became an administrative one.

The emotional factors that stimulate the production of anxiety, and its subsequent displacement to the more basic "fear of flying," stand out in bold relief in this case. This is not true in all cases. Frequently, unrecognized but truly harmful emotional factors are so obscured and difficult to recognize that only a patient and thorough psychiatric investigation will uncover them.

Role of basic universal "fear of flying." At this point, one may ask what actual part in the problem is played by the basic, perhaps universal and instinctive "fear of flying." Undoubtedly, all persons who desire to fly—that is, to be sustained in the air with no visible support from the ground—originally possessed a basic, perhaps instinctive "fear of flying," through the knowledge that a failure in the mechanism of being sustained in the air could result in injury or death by falling through space with great force until impact is made with the earth.[5] This fear is merely another expression, whether fully instinctive or partially learned, of the fear of death, injury, or mutilation. Those of us who fly only as passengers need only suppress or tolerate this basic fear temporarily in order to have confidence, during a flight, in the fliers in whose hands we place our lives for safekeeping. Those, however, who participate actively in sustaining themselves in the air by controlling and determining the movements of the plane must necessarily have taken more permanent adaptive measures which permit them to function proficiently and safely in their flying duties. Although they knew initially that flying was dangerous, they were able to adapt psychically and physically to their new environment in order to fly safely.

When, therefore, previously effective pilots, who already possess training and experience and for whom flying has been both profitable and pleasurable, become fearful of flying or, as a manifestation of fear, present disturbed behavior or physical symptoms which interfere with a suitable adjustment to flying, it becomes very difficult to lay the blame solely on the original basic "fear of flying." We must look in another area to understand a disturbed pilot's difficulties, and recognize that, as in the case described above, conflicts, insecurities, and frustrations of many types play a much greater role in the "fear of flying" syndrome than does the basic, perhaps instinctive fear of death or mutilation which is inherent and ever present in the unnatural act of flying itself.[5]

Definition of "fear of flying" syndrome. The "fear of flying" syndrome may then be defined as a complex reaction occurring among previously adjusted flying personnel, and characterized by various defensive and maladaptive behavioral processes which express excessive anxiety over various external and internal conflicts, frustrations, insecurities, and dangers; as such, it is distinct from the basic, inherent fear of being maimed, mutilated, or killed by falling through space and hitting the ground with great force. It may be characterized by statements of "uncontrollable fear of flying" (pseudophobia) or by frank refusals to continue flying, but more often it manifests itself in one or several of the following maladaptive patterns of behavior: (1) Obsessive overconcern related to the functioning of the plane; (2) true phobias (flying, claustrophobia, et cetera); (3) psychosomatic disturbances of many varieties and degrees; (4) behavior disturbances revealing inadequacy or delinquency (emotional instability reactions, passive and/or aggressive reactions, alcoholism, and malingering); (5) true neuroses; (6) pseudopsychoses; and (7) true psychoses.

With the exception of the aeronautic frame of reference, these expressions of maladaptation parallel almost exactly those commonly found in army combat reactions.

DISCUSSION OF ORIGINS OF "FEAR OF FLYING"

The origins of the "fear of flying" syndrome are to be found in those conflicts common to all men, whether in a civilian or military setting. This syndrome, as is the case with other problems of maladjustment, is generated by the conflicting demands made on a man by his instinctual needs, the internalized authority or superego, and external reality. These basic factors in psychic adjustment are interdependent, and increased stress on one affects the others in the same manner that stress on one link in a chain affects all its links. As revealed by our clinical research experiences, the basic factors representing important areas of

conflict in this syndrome are listed below. Various case histories to be presented later will clearly demonstrate their effects. Some knowledge of the military aspects of these factors will provide a better understanding of their operation in the "fear of flying" syndrome. They include:

Instinctual needs: Interpersonal relationships (libidinal ties, identifications, and object relationships); need for self expression (love, aggression, dependency and security, excessive restrictions or freedom in expression of these instincts).

Superego forces: Structure and demands (personal integrity, loyalty, guilt associations, punishment, and "magical sense of omnipotence").

External reality: Reality goals (in relation to motivation, age, experience, and assignments); incentives (their availability, attainability, incongruities, and satisfactions); acts of fate, or chance (dangerous or harrowing experiences); problems of self-survival versus physical environment of aviation; and opportunity for success or failure in combat.

CONFLICTS OVER INSTINCTUAL NEEDS. Disturbances in personal relationships and libidinal ties which stifle the need to express affection or resentment in suitable ways can excite, in susceptible persons, excessive anxiety which then is channeled into disturbed or distorted defensive behavior.

In this process there is regression from previous good adaptations to more immature and infantile behavior. Earlier modes of behavior that served, consciously or unconsciously, to gain sympathy through illness or weaknesses, or even to invite punishment and loss of love through bad acts, are revived in attempts to handle these conflicts. Difficulties are vividly projected on a seemingly unkind environment through rationalizations supported by only the flimsiest of evidence. Rumination and preoccupation over past misdeeds or failures appear. The "magical sense of omnipotence" so important to the ease of mind needed in successful flying is replaced by unexplained fears of retaliation or feelings of imminent threat to existence from the surrounding environment.

Emotions of resentment and anger that cannot be expressed adequately, and beliefs that prestige or importance are being denied, belittled, or challenged, often become displaced into complaints over totally unrelated difficulties, especially in those men who possess overly strong superego or conscience structures which prohibit open aggression. This is especially true in situations where mild expressions of aggression and hate, and even of love and affection, are, except under very special circum-

stances, greatly restricted or forbidden. Defiance of authoritative figures for whom markedly ambivalent emotions are felt is possible only for the few who dare to face the consequences. More commonly, when such frustrated feelings become quantitatively unmanageable because of the anxiety they stimulate, many men consciously or unconsciously set up compromise reactions, which may take their toll on physical and emotional effectiveness. In the "fear of flying" syndrome, only a few are capable of stating their emotional difficulties directly by saying "I cannot and will not fly anymore."[8] Most, as we shall see, must express these disturbances symbolically by developing ineffective behavior, or real or imagined physical symptoms.

CONFLICTS OF SUPEREGO FORCES AND PRESTIGE VALUES. A paradoxical change has taken place in military aviation. While costly aircraft have become increasingly complex, highly evolved machines, requiring special ingenuity and exceptional abilities upon the part of the pilots who fly them, the prestige, importance, and glamor formerly accorded these fliers has considerably decreased.

Previously, in both World Wars I and II, pilots were regarded with awe and high respect, and often treated like vaunted heroes of old, if not always on a national scale, at least in their home localities. Now, except for those pilots who become aces or "MIG killers," or who perform extraordinary feats like breaking the sound barrier, flying at previously incredible speeds, or for thousands of miles in astoundingly short periods of time, most fliers receive little recognition or acclaim, especially if they fulfill only routine flying missions such as carrying out defensive missions, bombing, supporting ground troops, or transporting cargo or troops. They usually go unnoticed almost completely even in their military environment unless they become involved in some personal or occupational difficulty, or develop a "fear of flying." That this lack of recognition may even be the lot of many fighter pilots who work diligently at their jobs but fail to attract attention is clearly demonstrated by a recent statement made by a leading jet ace: "When I went overseas, not even my wing-man would listen to me; now I'm an expert on world politics, a philosopher, an actor, and I don't know what all." Routine military flying now rarely is the source of more than casual, passing interest. The military services look upon aviation only as a normal and necessary part of the total war machine needed by a powerful and wealthy nation. Most of the public now accepts military aviation with very little of their earlier wonder and amazement over what once appeared to be a magical if not miraculous accomplishment. Aviation now is big business which, though requiring a few important people, depends on the labors of many obscure people who, regardless of the difficulty of their

duties, excite little general interest. Observe the mammoth Globemasters gracefully flying through the air and remember that, unlike some "MIG killer" pilots, not one of their pilots is nationally known.

The satisfactions accompanying personally desired types of flying or duty assignments often come in conflict with the Air Force's need for useful as well as versatile pilots. Because certain types of persons do better in specific types of flying, versatility versus utility becomes a major problem. The Air Force with its ever changing frontiers and military needs frequently must force persons into types of flying they would never choose for themselves. If they enjoy their assignments, many pilots will put up with personal frustrations and hardships which in less happy circumstances might easily precipitate emotional disturbances. This difficulty is also reflected in the "fear of flying" problem.

Reality goals and motivation vary in relation to time, underlying desires, responsibilities, and incentives. Pilots who during World War II may have flown almost without caution and at times with reckless abandon, with no real fear for their future, have now returned to flying with different attitudes and behavior. Some try to recapture their earlier abandon and relive their "wild-oats" period in a devil-may-care way, only to find that they can revive these early experiences in memory but cannot relive them with ease. Now responsibilities and an ingrained dependence on many other persons in their daily existence have taken a stronger hold than they realize. Nevertheless, the majority of these men do very well unless their emotions are subjected to excessive stress by underlying resentment, ambivalence, or insecurity in personal relationships, or by indifference to their abilities in relation to their status in the group.

Inequities and discrepancies in rank, pay, and status in relation to age and experience can easily lower a man's evaluation of himself as he compares his abilities and previous achievements with others of higher rank whom he believes to be less able and experienced. This not only damages a man's effectiveness but also leads to difficulties in his assimilation into the total group. Stifled initiative, unreasonable restrictions, failure to make use of available talents other than flying, and boredom through inactivity or repeated needless repetition of unessential training frequently play invisible havoc with a man's ability to adapt to and accept his situation.

Failure to be accorded the regard he believes to be his due, especially if associated with doubt over his leader's ability, causes a man to lose confidence not only in his leaders but in

himself, his aircraft, and even in the Air Force. Though fact and fantasy may be intermingled in his reasoning, his reactions are real and often harmful.

A leader's misconceptions of the meaning of leadership, when expressed through harsh or inept management of the military duties and everyday life of those under his command, can drastically affect the emotional attitudes of the men who must abide by his commands and foibles. As one famous author wrote, "*discipline* is based upon *trust* and *confidence*." A leader's qualities, whether good or bad, are mirrored in the attitudes and behavior of his men. The good leader cements the group together by building an "esprit de corps" as he works with them, encouraging them in many ways. He praises when praise is indicated and criticizes only when it is really necessary. Men react adversely to constant negative criticism which uses "don'ts," or singles out men's honest faults for punitive purposes or as a means of enforcing discipline. The good leader tolerates differences of opinion, and allows enough freedom of expression to develop his men's initiative and to give them a feeling of belonging, rather than one of oppression. But when unified action is necessary, as in combat, he guides his men with a firm assurance which brooks no marked dissension or slovenliness. When leadership means proper organization, and when all the men are aware of each man's function in the group and are allowed some freedom of action, leadership is both desired and enjoyed. The leader who rules only through regimentation and restrictions in a rigid setting to gain control of his men is unreasoning, and unmindful of the men's ability to think and act for themselves. A leader who is indecisive and unreliable or overly punitive and inflexible not only distrusts both himself and his men, but elicits the same response from those in his command. This is illustrated by one pilot's remark about his former commander: "He used the regulations to the limit to enforce his command responsibilities. He didn't take into account the human factor, for if he had done so, or exercised a little better judgment and understanding, he would have gotten a lot more out of us." If this attitude was really widespread in this pilot's organization many difficulties would ensue. These problems frequently exert a strong influence on the "fear of flying" syndrome.

Patriotism is of the greatest importance in times of actual national danger or worldwide war, but unfortunately, for many men, it alone does not ordinarily inspire them to take up arms and undergo military hardships in times of apparent peace, or in response to high sounding abstractions such as "we fight (in strange lands) for the peace of our nation and the world, and for the happiness of all humanity." Men are courageous, but their own personal needs often are far more important to them than the

needs of others with whom they may have little in common, or with whom they have no real racial or traditional bonds. While the recognition and acceptance of duty may appear to be in response to the dictates of patriotism, it is greatly influenced by external authority, by a man's sense of personal integrity, and by his loyalty toward himself and his group. This internalized authority, recognized as his superego or conscience, requires him to live up to the dictates of his society, military or civilian. When this conscience or superego is too punitive or too strong, insisting upon unremitting obedience, the anxiety arising from inner struggles often is channeled into behavioral or physical disturbances. The need in men with such strong or harsh superegos to develop real or imagined illnesses as the only allowable escape from the demands of reality has been long known but less frequently recognized. The physician would do well to be vigilant, and recognize when disturbed behavior or physical complaints indicate that they are caused by forces instigated by a man's superego rather than by conscious subterfuge or malingering. As will be pointed out later, the same superego or conscience can often be used to help a person resolve his problems and even to motivate his return to effectiveness. If a man's superego is deficient and he lacks real personal integrity, loyalty, and attachment, the medical officer will find it difficult to get him to accept his obligations. When such men are found hiding behind a "fear of flying" reaction, the medical officer must not hesitate to reveal their true motives so that proper action can be taken.

Success or failure depends upon a good relationship with the group. Each man's success or failure is chiefly determined by how well he makes himself a part of his group, and how he handles underlying insecurities and conflicts within himself and with others in his environment. If he succeeds in handling the anxieties resulting from these conflicting relationships he does so by developing defenses that are suitable and acceptable to society, although they may cover up underlying inadequacies and neurotic difficulties.

Good adaptation means, despite these conflicts, to perform effectively in any situation while accepting certain frustrations and postponing the gratification of many inner needs until the proper time and place for their satisfaction. All of these conflicts are woven tightly into the warp and woof of the fabric of the "fear of flying" syndrome. To understand the meaning of these conflicts, each problem should be carefully unravelled.

PSYCHOLOGIC MANIFESTATIONS OF THE PROBLEM

EFFECT OF REALITY SITUATION. External danger itself and even extremely harrowing, specific experiences may not ordinarily be

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enough to cause flying personnel to give up flying, even though they may at times appear to precipitate a "fear of flying" reaction.

Case 2. Mid-air collision. An enlisted man riding as a passenger had escaped death in a mid-air collision between two military planes only by parachuting to safety. Despite the fact that the two occupants of the other plane were killed, he proceeded shortly thereafter to accept military flying training, saying nothing of his previous harrowing experience. Much later, during routine questioning following completion of his combat tour in Korea, he revealed that this escape from serious danger had given him greater confidence in his ability, because he believed he could face any other emergency situation which might present itself.

During the difficult combat period experienced by the Eighth Air Force in World War II, when the fatality rate and loss of planes was so high that each mission had to be accepted with complete fatalistic submission, many men openly expressed the desire and the need to give up flying. Most of them, however, did not allow themselves to give up. They continued to perform effectively even though death for many of them was imminent.

An illustration of a real experience that could have caused a pilot to quit flying for good is given in the following case:[5]

Case 3. Threat of death from enemy action. A 23-year-old F-86 pilot underwent an extremely frightening experience when he was shot down on his first combat mission. After struggling to release his canopy, he ejected barely above the minimum altitude for bailing out, injuring both knees. Upon reaching the ground, he was at first unable to operate his radio and emergency equipment because of his confusion, but finally was able to collect his wits and take proper action. He was immediately hemmed in on all sides by enemy small arms fire. On one evasive movement he was caught in an open area and about to be shot by the enemy, but was saved by the strafing action of pilots from his squadron who flew cover to aid him. His main thought during his terrifying escapade was that he "preferred to be killed than taken prisoner by the enemy." After one and a half hours of constant evasion, he was rescued by a helicopter, but entered the hoisting harness in the wrong direction. After being lifted about 150 feet he almost fell out because of his unsuitable position, but was grasped in time by the medical corpsman. Despite enemy action the helicopter pilot had to lower him to the ground in this precarious position so that he could be hoisted properly.

During psychiatric review it was evident that this pilot was a very stable person who maintained a state of equanimity both in his personal relationships and in his attitude toward the dangers inherent in his combat assignment. His motivation for flying was both strong and sincere, even though he was keenly aware that he might still be shot down again and possibly even killed. He was not reckless or callous to

danger, but accepted his dangerous experiences in a matter-of-fact manner. He resumed flying and completed his combat missions without further serious mishap.

Case 4. Severe flak damage. A 23-year-old pilot underwent the unfortunate experience of having his fighter aircraft hit by severe flak on two consecutive combat missions. He succeeded in landing on the first occasion, and bailed out on the second. He reacted with anxiety severe enough to require immediate hospitalization. After several days, despite evident anxiety, he began insisting vigorously that he be returned to flying.

While his eagerness was commendable, it should have been recognized as an expression of persistent and excessive anxiety—not just over flying again but over a possible loss of group prestige—and of his great need to regain mastery over his environment in order to recover his "sense of omnipotence." His background indicated some minor accident proneness, especially on the ground. Against his own better judgment, the flight surgeon finally allowed him to return to flying, and he crashed during a routine ferrying trip, under mild instrument conditions. This pilot's harrowing experiences had not prevented him from flying, but his excessive need to regain status led to a fatal outcome.

Comment. If the reasons for his anxiety had been better understood, this pilot might not have been lost, for here again, as in the first pilot, conflicts other than the basic fear of mutilation or death played important roles in producing untoward disturbances. This re-enforcement of the basic "fear of flying" by other conflicts is also instrumental in developing the "fear of flying" syndrome.

EFFECT OF CONFLICT WITH INSTINCTUAL NEEDS. It is important to stress that, despite competition, frustration, fear of failure, and doubts over the motives and abilities of others, the great majority of flying personnel perform their assigned duties successfully. In this era of confused ideologies and cold war, no one is without some insecurity and conflict in his everyday life. Most of these men have learned how to deal with the basic insecurities relating to possible loss of love, affection, and prestige, and face fears of retaliation from the environment with equanimity. Some perform successfully despite underlying phobias and other neurotic traits because they can ordinarily control such difficulties during flying. But when a sudden surge of repressed or long avoided conflict gives rise to overwhelming anxiety, these men may lose their defenses and fail temporarily, as is revealed in the following case.

Case 5. Syphilophobia in a successful pilot. A 30-year-old married pilot presented himself to the flight surgeon after eight B-26 night missions, indicating he believed he had an unrecognized syphilitic infection which led him to fear that if he were shot down over enemy

lines he would soon become very ill because the enemy would not give him proper care. Investigation revealed that this captain actually had possessed a syphilophobia since 1942, when, as a cadet, he had become intoxicated and experienced sexual contact with a prostitute in a house of ill repute. Since that time he had had periodic episodes of excessive worry and guilt over this sexual exposure. Several months after the exposure he developed a small penile papule which was not considered venereal and disappeared without treatment. Off and on he would seek reassurance over an intermittent slight urethral discharge, diagnosed as a mild chronic prostatitis. Despite medical reassurance and repeated negative findings for syphilis, this obsession remained in the back of his mind. He lost no time from flying except for the two years that he served in a noncommissioned, nonflying status as a master sergeant on recruiting duty. With the outbreak of the Korean conflict he returned to piloting B-29's, still mildly obsessed with his secret worry over syphilis. It was only after he was transferred to Korea to fly B-26 night bombers that this obsession became so marked that it interfered with his performance of duty. His reaction was so serious that he was referred to both the psychiatrist and to the chaplain. He was so rigid and fixed in his guilt feelings over his past misdeed that even religious guidance failed to help him. When first seen psychiatrically, he could not imagine that he could be helped in any way; however, investigation revealed that as a very rigid and compulsive person he performed his duties satisfactorily, but rarely with any evidence of real initiative or drive. He was a quiet, fairly passive person who was accepted in the group, but he rarely participated in most of the unit activities. While a master sergeant he had actually been very content with his nonflying enlisted status, except for the difference in pay. In being transferred from B-29's to B-26's his personal responsibilities for the aircraft and his crew had been greatly increased. He had many doubts about his abilities to live up to the military requirements of his rank. His only motivation for continuing flying was that he could not obtain any other job with such excellent monetary returns, neither as an enlisted man nor in civilian life. He had no qualifications other than a pilot's. He had no executive ability, no real leadership ability. Before each of his night combat missions he would become nauseated and, prior to flying, force himself to vomit in secret. His anxiety would remain with him until he strapped himself into his seat; then he would feel better. Before his ninth mission, however, he felt so anxious and nauseated that he asked to be excused. This meant that another pilot and crew had to take his place. For the next few hours, as he lay in bed, he scourged himself for being a coward and was greatly alarmed that something would happen to his replacement crew. By early morning he vowed to himself he would turn himself in and give up flying forever. When he went to the flight surgeon, however, he could not bring himself to talk about his underlying feelings of inadequacy and failure, but spoke only of his obsession concerning syphilis. It was evident that, although on the surface this

man had appeared normal to his comrades and superiors, underneath he was plagued with marked turmoil over his responsibilities and the necessary decisions that he had to make concerning his future.

Comment. This man's real difficulty—fear of being a failure in the eyes of others—motivated him to continue to try to fly when his real wish was to give up what flying meant to him. His retreat into guilt-ridden ruminations and obsessions might appear peculiar, but they represent his attempt to handle the problem of living up to real obligations toward which he felt inadequate. His conscience was such that, as he gained insight into the meaning of his anxiety, he was capable of readjusting and returning to full flying duty. Psychiatric assistance aided him in resolving those conflicts over responsibilities to the Air Force which might have made it necessary for him to face a "fear of flying" accusation.

CONFLICT WITH PRESTIGE VALUES. The effect on flying efficiency of minor resentments over many reality factors is well demonstrated in the following case of a pilot who talked of "uncontrollable fear of flying" but who had no real anxiety.[5] The only diagnosis which can be made in this case is "no psychiatric or physical disease found, fully qualified for flying duties."

Case 6. "Fear of flying;" an expression of conscious resentments. After he had been transferred to a combat bombing assignment, a 32-year-old B-29 pilot with past experience as an instructor in single engine flying during World War II stated: "I am through with flying because when I fly I get worried, I'm upset and nervous, I don't want to be a problem, but I have no confidence in myself or the airplane. I don't want to kill the boys through any ignorance of mine. Before it was just my neck, but now it is different." He believed that he was no use to the military service, stated that he felt insecure about instrument flying, and insisted that if he were forced to continue he would fail. On psychiatric review it was evident that while this man was very forceful in stating his desire to give up flying, he really had no true difficulty. He was found to be well controlled, with no evident anxiety, but with a great deal of resentment over such matters as being forced to fly with younger, less experienced pilots who, because of their higher rank, occupied authoritative positions above his. Seven years after discharge from the service in 1945, he had been recalled at the same rank that he had possessed then, and the fact that he now was older and more mature yet commanded less respect proportionally from his flying colleagues hurt him deeply. He also revealed that his wife was endeavoring to prevent his return to combat flying. No actual medical problem was demonstrated in this man which would warrant any treatment. After a discussion of his situation and those resentments based on reality, he recognized the effect of his own feelings concerning prestige. He was returned to his flying duties, either to accept them or to face administrative action if he decided not to fly.

Comment. It is obvious that this man was reacting more to narcissistic injuries and a lack of ego gratifications surrounding prestige than to a true basic "fear of flying."

CONFLICT WITH STRONG SUPEREGO. Many men with well-structured superegos but with similar conflicts over basic needs frequently present, either on transfer to overseas assignments or early in their combat tours, various forms of disturbed behavior or physical complaints. Many have been handled effectively by flight surgeons who recognize the meaning of the symptoms.

Case 7. Acute disorganization early in combat tour. An interesting example is that of a young pilot who, after 13 jet fighter missions, dashed, in a markedly agitated and disorganized state, into his flight surgeon's tent in the middle of the night. He appeared so disturbed that the flight surgeon thought he was delusional; however, instead of becoming alarmed, the flight surgeon instituted immediate supportive treatment which included heavy sedation, complete reassurance, and, as the patient recovered, ego strengthening discussions. After two days of therapy this pilot made a rapid recovery and went on to complete his combat missions.

Comment. In this case the medical officer must have carefully considered this man's total behavior, present and past, and was not rushed into making a rash decision regarding final action. If this man had been immediately sent to a psychiatric hospital as mentally deranged, his return to duty would not only have been delayed, but might have been rendered difficult or even impossible. Early repression of conflicts in this case was all that was necessary.

In the following case of a man with a strict superego, early psychiatric treatment helped him to adjust adequately.

Case 8. "Fear of flying" syndrome in neurotically depressed pilot with excellent superego structure. Shortly after his arrival in Japan, a 23-year-old first lieutenant, a B-26 pilot, was hospitalized because of evident depression, feelings of anxiety, crying spells, fears that he would "never see my family alive again," and insistent demands that he be permitted to give up flying forever. Early in his examination it became evident that he did not truly desire to give up flying, and that his depression was a reactive one which occurred immediately after his separation from his wife of one year. Previously he had approached his flying duties eagerly and had accepted his transfer from B-29 flying to B-26 fighter-bomber flying with great enthusiasm. Flying B-26's he had found to be "personalized." They had given him a real sense of exhilaration and personal prestige because, unlike B-29's which required co-ordination of a group, they allowed him complete control over the plane himself. His past record revealed that he had been an excellent pilot and that he had planned to find a future either in military or commercial aviation. During discussions he would vacillate

repeatedly between an almost childish plea to be sent home immediately and demands to be sent to Korea so that he could assume his flying duties as soon as possible. His indecision over his need to comply with obligations and his need to be dependent and to take no responsibility for his decisions was visibly mercurial. Actually, it was only after he had left his wife and child that he developed any anxiety related superficially with his feelings that he would never see his wife and child again. During his transfer overseas he had been hospitalized at two other air base hospitals for short periods of time. His stay at each hospital was the same; each time he would experience the same depression which, with the psychiatrist's assistance and the encouragement of his wife who would fly to visit him, would end in his decision to carry on. Psychiatric evaluation revealed a major point in the fact that this man had never faced any real responsibility on his own until he was ordered overseas. All through cadet training and as a B-29 co-pilot, other stronger persons had constantly supported his efforts. Because he had a pleasing personality and was highly motivated for flying, everything had been made "easy for him." As the only child of a successful police official, any conflict which arose during his growth and development was taken care of so that he never was required to make any marked effort on his own. While his father was described as a kind but strict parent, this pilot looked upon him with great respect and a feeling that he could never measure up to his standards and achievements. It therefore became evident at this point in his career that he was entering into an active competition in which he was to prove himself or fail. His dependency needs and timidity in accepting the responsibilities of reality were in marked conflict with his fear of failure and loss of prestige. This need to succeed and to avoid failure in the eyes of those whom he respected and loved was used as a motivating factor in leading this patient back to his flying duties. Any other decision would have marked him permanently as a failure. His fears about facing responsibility, and his basic superego and ego strength were used to encourage him to make a real adjustment. There was no real evidence of any other basic emotional instability. He quickly stabilized and, by his own decision to accept military flying, was sent to Korea again. He still knew, however, that he had the alternate choice of giving up his plans for a flying career and facing the consequences. Shortly after his arrival in Korea he showed a mild repetition of his original symptoms, but this time, again with good emotional support from his squadron leaders and the psychiatrist, he was initiated into combat flying. Because of his good personality structure and his high motivation he became well accepted by his group. From that time on he flew successfully and completed his combat tour in an outstanding manner.

Comment. It would have been easy during this man's psychiatric treatment to have precipitated in him a severe "fear of flying" syndrome, with the result that, despite his excellent motivation and expensive training, he would have been lost to

military aviation and permanently stigmatized in his own eyes. No punitive attitude was assumed, however, and no threats of disciplinary action were made. Each time he showed definite signs of neurotically disturbed behavior, the proper understanding of his underlying needs and fears and the proper direction of his strict but well integrated superego prevented his developing a "fear of flying" which would have led to administrative action. The resolution of his conflicts coupled with an appeal to his strong superego was sufficient to return him to a normal emotional condition and allow him to function effectively.

DEFECTIVE MOTIVATION. Quite different in attitude and motivation is the case of the following man, whose statement of "fear of flying" merits the medical officer's decision to return him to his flying duties with the diagnosis: "No psychiatric or physical disease found; fully qualified for flying duties." This diagnosis definitely implies that the man is considered physically and emotionally capable of performing his flying duties although he may still claim an "uncontrollable fear of flying" and even demonstrate a mild degree of visible anxiety.

Case 9. Lack of true motivation for flying. A navigator, referred because of "fear of flying," had actually been in a minor aircraft accident in the United States but at the time did not reveal any marked emotional reaction. On his way to an assignment in Korea he made no complaints; upon arrival, however, he walked into the flight surgeon's office and stated that he was through with flying and no one could make him fly again. He was referred for psychiatric evaluation. Upon being interviewed he immediately stated, "This won't help. I can't see you getting me to change my mind." In the discussion that followed it was made clear that our intent was not to change his mind, but to try to understand the difficulties leading him to make such a decision. It became evident that this man had never really been motivated for flying duties; however, because of his intellectual ability and some college background he had chosen flying training to avoid serving as an enlisted man in any other capacity. He believed that he could fly as readily as perform any other duties; in his early training, however, he had been washed out as a pilot because of "lack of co-ordination" and assigned to radar observer training, which he accepted even though he frankly admitted that at that time he had no true desire to perform these duties. This course of action gave him a commission as an officer. While still in the United States, he had considered turning himself in for "fear of flying," but realized that, had he done so, drastic action on the part of administrative authority would most likely result in the loss of his commission and separation from the service. He waited, therefore, until he had arrived at an overseas theater where he believed he would simply be grounded, yet remain an officer. This man was unmarried, and had no real responsibilities except to himself. His only interest in the service was gaining a nice

comfortable assignment as a ground officer, preferably in administrative work, for which, with his academic background, he could qualify and which he would enjoy. He indicated that because he feared flying, as a radar officer he would be a danger to his pilot, and therefore he was of no use as a flying officer. Again it was obvious that while this man used "fear of flying" as the reason for giving up flying, there was no true anxiety, but merely a lack of motivation for flying duties and a negative attitude toward living up to the standards he had accepted when he was given a commission as a radar observer. This man was playing his cards skillfully to see if the military would either accept his game or call his bluff.[5]

In such men as the one described above, despite statements such as "I will not fly anymore because if I do I'll crash and kill myself," or "I don't want the responsibility of other people's lives on my hands," the medical officer must clearly recognize the presence of resentment and lack of motivation, and have no fear about returning these men to flying duty. If such men return to flying, as most of them do, their instinct for self-survival, previous experience, and excellent training will usually protect them against any untoward results, and cause them to exercise control over their flying. Many who, although showing some degree of visible anxiety, effectively ventilate their underlying conflicts as did the B-29 pilot, can usually be led authoritatively back to their flying obligations. Those who continue to refuse to fly must face administrative action and accept the consequences. In these cases the medical officer must have the courage of his own convictions and the ability to take decisive action. These qualities are especially necessary for dealing with men who refuse to fly because of disinterest, selfish motives, absence of loyalty to themselves or the group, or lack of personal integrity. They should be declared "No psychiatric disease found, fully qualified for flying duties," with the recommendation that if they continue to refuse to fly they should face whatever administrative measures are deemed applicable according to established Air Force policies.[5]

CONFLICTS EVINCED BY ACUTE PSYCHOTIC AND PHOBIC BEHAVIOR. Frequently, in the realm of borderline emotional or physical disturbances, including various types of behavior, phobias, and psychosomatic complaints associated with flying, the medical officer finds it very difficult to render a sound opinion. Based on good judgment and an intelligent understanding of the needs of the men and of the Air Force, he therefore should be flexible in his attitudes and opinions until he can arrive at a suitable decision. A rigid system of categorizing may lead him into regrettable errors, for if he believes that all cases suspected of "fear of flying" are actually such, he may make gross mistakes similar to those made in other medical situations. For example, rare

cases of bronchogenic carcinoma have been erroneously diagnosed as pneumonia by well qualified roentgenologists because the roentgenograms had been viewed at the same time as many roentgenograms of pneumonia cases. Superficially, both may appear to be very similar.[5] Because of such similarities the medical officer may be "mentally set" to put all cases in one category and therefore may fail to recognize other medical or psychiatric conditions which may require different treatment.

For example, one man considered to be a "fear of flying" case actually was suffering from a marked anxiety reaction which occurred after he had completed his required missions. This is a common reaction which at times occurs upon withdrawal from dangerous situations.

Case 10. True phobic reaction treated as "fear of flying." A 25-year-old pilot who had been chosen as a distinguished flying cadet and given a regular Air Force commission because of his outstanding achievements had, after his return from combat flying, displayed marked anxiety over renewing his routine patrol flying in jet aircraft. He had actually completed 26 fighter missions in Korea on a temporary duty status, from his base in the Philippines. Following completion of his missions he had been inactive, doing no flying for about six weeks. Upon his return he displayed a great deal of verbal anxiety about returning immediately to regular flying, and insisted that he be first given some check rides with an experienced pilot. This odd behavior, plus conflicting statements made by observers who described his combat flying as erratic or indicated his combat flying was average for a first exposure to combat, led his squadron superiors to believe that he had developed a "fear of flying." He was later seen by a medical officer who, although recognizing his anxiety state, took no steps to obtain further assistance in working out his problem. The arguments and indecision over the disposal of his case were so prolonged that, in desperation over the confusion, this pilot actually signed a "fear of flying" statement admitting "he was afraid." But later, in view of the fact that he had an excellent past record, he was finally referred for psychiatric review, where it became evident that this anxiety reaction following combat was real and of a type seen frequently enough among men following relief from combat tours. In these instances other internal conflicts, chiefly related to status within the group and to the fear that, despite present survival, something must happen, are usually held in abeyance during combat, but flare up with increased intensity upon return to zones of relative safety.

Comment. To call this man a "fear of flying" case, thus exposing him to administrative action without further psychiatric evaluation, and denying him reassuring supportive treatment and an opportunity to make several supervised training flights, was a serious error. Temporary grounding with a recommendation for therapy over a period of time to allow his anxiety to be resolved

might have prevented his loss so that as a previously valuable flier and excellent officer he might have been salvaged. No other course of action should be considered until a period of active treatment, during which the man is helped to understand his reaction and is given the opportunity to readjust and return to efficient flying, fails to have the desired effect. At this point the pilot can make his own decision whether to continue or give up flying. As may have been true in this case, sentimental exhortation or harsh disciplinary measures without a real understanding of the causes of anxiety may stifle in the best motivated men the desire to render good service.

This technic, used in the Far East, has prevented the loss of flying personnel who have later proved themselves of great value to the Air Force. No punitive administrative action is really indicated in these instances. This is well demonstrated in the following example of an actual severe phobia. Careful appraisal of the underlying factors, made prior to a final decision which could have meant the loss of a pilot, produced excellent results despite the presence of an underlying neurotic potential.

Case 11. Reactivation of earlier phobic reaction. After completing 30 missions, and during three consecutive missions performed at night in "pitch black weather," a 26-year-old B-26 pilot developed an overwhelming anxiety which, spreading to activities other than flying, made him so tense that he became completely ineffectual. Both his flight surgeon and his commanding officer were really concerned over his behavior, because up to this time he had been an outstanding pilot who never shirked his duties regardless of their difficulty. He had even taken on extra ground duties which left him little free time of his own, and had acted as instructor for other pilots in their combat training missions. An attempt was made in some quarters to construe his case as one of "fear of flying," based on the possibility of underlying disinterest and lack of "moral fiber." Despite an attitude which revealed a desire to return to flying, this pilot could not force himself to do so. Because of his excellent past record he was referred early for psychiatric evaluation, and during this investigation many resentments were found masked behind a superficially calm and conforming attitude. At first, because of a personality pattern which could not allow him to verbalize his emotional reactions, he was reluctant to talk. It soon became evident, however, that his reactions to the casual attitude of his superiors in various matters of flying safety were ambivalent. His voluntary ground duties had become so time consuming that he had actually fallen behind in the number of missions flown, and it had been suggested that he maintain his missions with another group which would make his departure later than he had expected. At times this change of schedule forced him into idleness, because he had to remain on the ground while the pilots of the new group, having flown fewer missions, needed time to catch up. He had mixed feelings about those who worked with him. He was held in high

esteem and was recognized as a pilot far above average. He did not drink or smoke, and was considered to be progressive in flying proficiency. Both at this base and at his previous bases he had volunteered for training and checking out of the pilots in aircraft with which they were unfamiliar. He had always been quiet and gentle, and avoided arguments. Where other fliers would become openly annoyed and voice their dissatisfaction over irritating situations, he would just "let them go" without saying anything. This attitude became more meaningful when he revealed that as a young child his older brothers used to cover him with a blanket and hold him tightly bound in complete darkness until he would become overwhelmed with fear. When they released him, however, he would never react angrily or fight them. This reaction to darkness was further demonstrated when he told of how, when taking his aviation cadet physical examination, he had become almost panic stricken while waiting in a dark room for his eyes to dilate prior to refraction. He was about to leave the room because of increasing anxiety when he was called out for examination. It becomes strikingly evident that this pilot had constantly suppressed or repressed a phobic reaction and flown successfully until his underlying resentments and conflicts had become too great for him to accept. He then regressed into a phobic reaction which had its roots in early childhood. Up to this time he had always overcome his "neurotic potential," and all of his previous military flying had been efficient and highly commendable. In treatment, which because of his earlier defensive taciturnity, took about six weeks, it was revealed that he possessed a strong superego and great loyalty to his group, which at first made it very difficult for him to express feelings that others might have voiced more openly. Upon termination of treatment, however, this same personal integrity and excellent superego structure allowed him to return successfully to his flying duties, consisting chiefly of night combat flying, and he completed his combat tour with no further difficulty.

Comment. Again it becomes evident that early psychotherapy of a ventilating and reassuring type which exposes unwholesome defenses can resolve anxiety states which, though appearing as "fear of flying," are really related to many other basic emotional conflicts.

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(To be concluded)

SURGICAL MANAGEMENT OF LOW BACK DISABILITY

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THE majority of patients with low back disability never require surgical treatment. It is our purpose to discuss those who do, and to attempt to clarify the diagnostic criteria which should determine the operative indications. In military service, the back problem constitutes a major one, and we believe that clarification of the current trends may be useful at this time.

In a cross section of orthopedic clinics, it has been found that surgical treatment is indicated in about five percent of the cases admitted. During the year 1952, 295 patients with back and/or sciatic pain were admitted to this hospital. In this group, 63 surgical procedures were performed. Several patients had more than one operation; *i. e.,* laminectomy, excision of intervertebral cartilage, and spinal fusion. A much larger group of patients were treated entirely on an outpatient basis, never having symptoms of sufficient severity to indicate hospitalization. Haggart and Grannis[1] report that of 6,402 patients examined because of back and/or sciatic pain, only 322 with severe symptoms were hospitalized. We are primarily concerned in this article with those patients who fail to respond to conservative treatment.

HISTORY OF SURGICAL MANAGEMENT

"Ollier,[2] in 1867, described a method of bone transplantation using an osteoperiosteal graft. This was the beginning of attempts to join segments of the spine to arrest disease and to alleviate pain." Hibbs,[3,4] in 1910, devised a method of using fragments from the spinous processes and laminae to obtain bony ankylosis. The Hibbs fusion was developed to include not only the spinous processes and laminae but also the lateral articulations, resulting in a solid mass of thick bone extending completely across the posterior surface of the spinal column. Modification, by Henry and Geist,[5] of this technic consisted of the addition of chips or slivers of autogenous or homogenous bone (fig. 1). In the same year, Albee[6] used a graft of free bone

From U. S. Naval Hospital, Bethesda, Md.

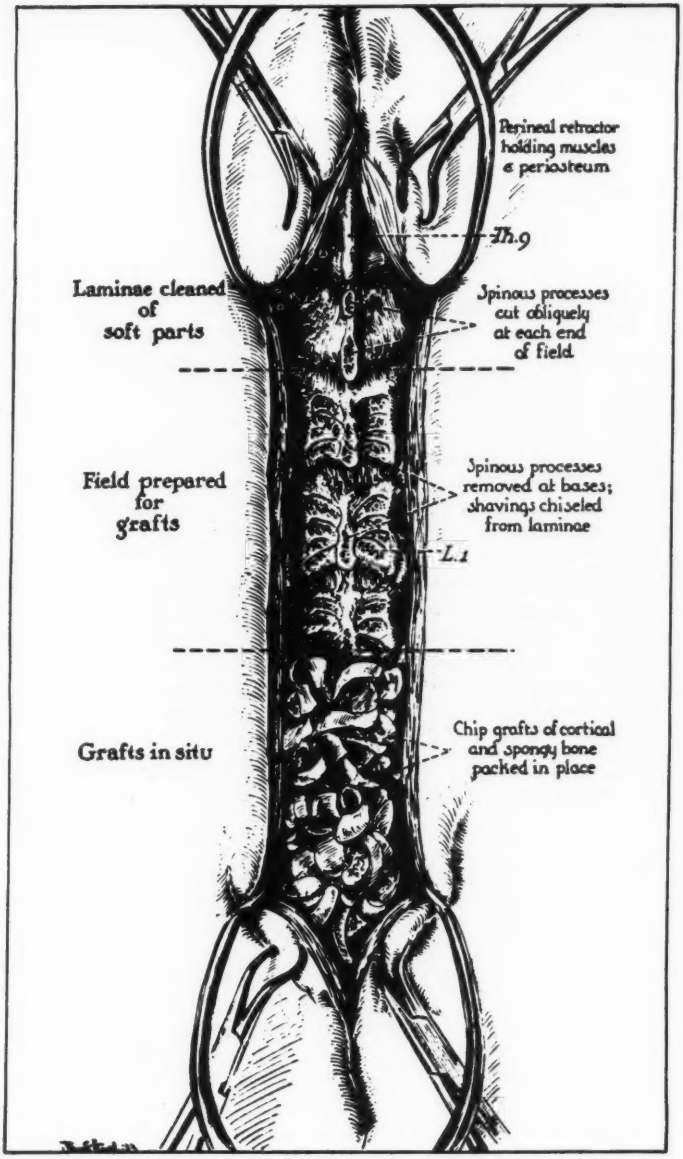
Perineal retractor holding muscles & periosteum
Th.9
Laminae cleaned of soft parts
Spinous processes cut obliquely at each end of field
Field prepared for grafts
Spinous processes removed at bases; shavings chiseled from laminae
L.1
Grafts in situ
Chip grafts of cortical and spongy bone packed in place

Figure 1. Modified Hibbs technic of spine fusion. (Reprinted with permission from Henry, M. O., and Geist, E. S.: Spinal fusion by simplified technic. J. Bone and Joint Surg. *15: 622-625, July 1933.)*

from the tibia of the patient (fig. 2). The procedure of fusion of the vertebral bodies was first carried out by Burns[7] in 1933 for spondylolisthesis. Many distinguished surgeons made their contributions to the subject, and several modifications were reported, notably by Forbes,[8] Radulesco,[9] Brown,[10] Kleinberg,[11] Ito and associates,[12] and Schede.[13] King[14] inserted metal screws across

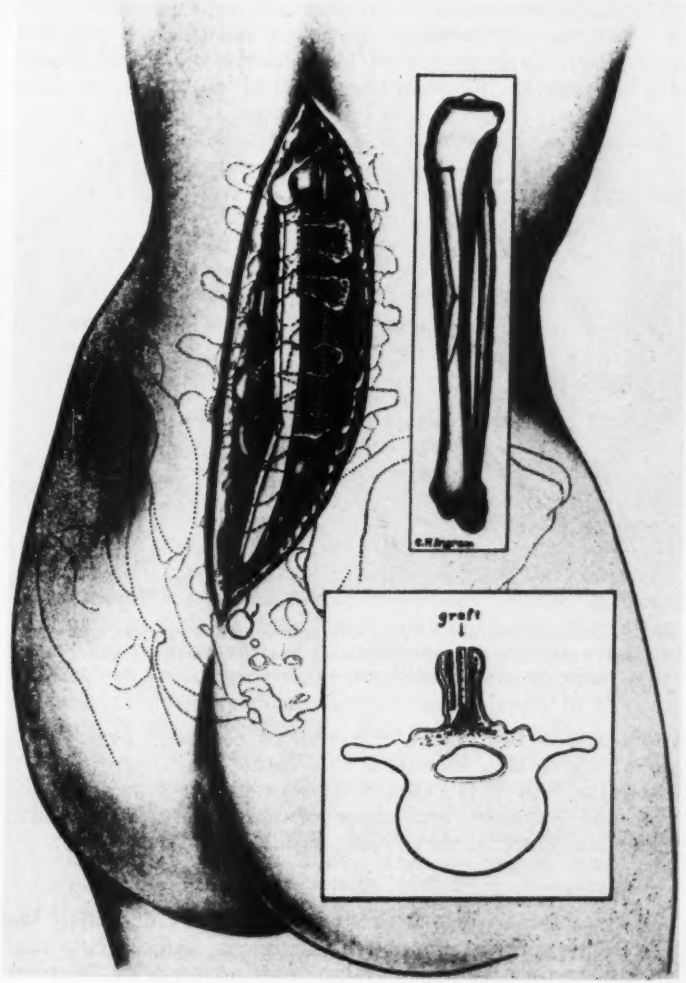

Figure 2. Albee technic of lumbosacral fusion. (Reprinted with permission from Speed, J. S., and Smith, H. (editors): Campbell's Operative Orthopedics, *Vol. II. 2d edition. C. V. Mosby Co., St. Louis, Mo., 1949. p. 969.)*

the articular facets, following removal of the articular cartilage of these joints. The screws were designed to immobilize the joints during healing, thereby hastening fusion. In 1945, Bosworth[15] described the clothespin or "H" graft, which consists "of a graft with the ends notched out to receive spinous processes at either end of the fusion area. It is placed with the patient in flexion and the spinous processes separated. The patient then being extended, it is maintained firmly in position"[15] (fig. 3). Iliac strips are used to reinforce the graft. Bosworth reported successful fusion in 89 percent of his cases.

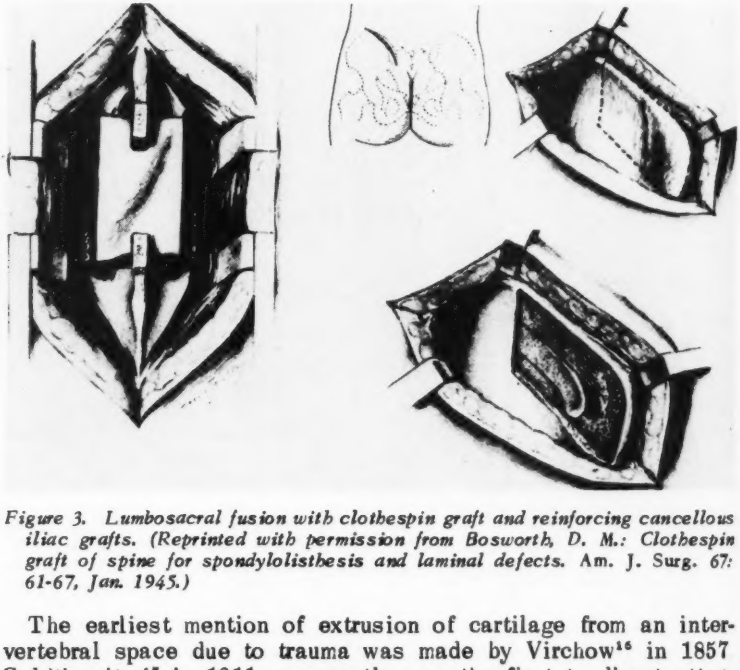

Figure 3. Lumbosacral fusion with clothespin graft and reinforcing cancellous iliac grafts. (Reprinted with permission from Bosworth, D. M.: Clothespin graft of spine for spondylolisthesis and laminal defects. Am. J. Surg. *67: 61-67, Jan. 1945.)*

The earliest mention of extrusion of cartilage from an intervertebral space due to trauma was made by Virchow[16] in 1857 Goldthwaite,[17] in 1911, apparently was the first to direct attention to the possible importance of the condition in producing compression of spinal nerve roots within the spinal canal.

SURGICAL TREATMENT

There are three general causes of low back disability which may indicate surgical treatment: (1) trauma, either acute rupture of an intervertebral disk, or malunion or nonunion of fractures of articular processes, pedicles, and laminae; (2) congenital anomalies, such as spondylolysis and spondylolisthesis, increase in the lumbosacral angle, asymmetry of the articular facets of the fifth lumbar and first sacral vertebrae, or transitional lumbo-

sacral vertebrae; and (3) degenerative conditions such as discogenetic syndrome—the dengeneration of the intervertebral disk with traumatic hypertrophic arthritis of the apophyseal joints.

TRAUMA

Acute rupture of a previously normal intervertebral disk is a rather infrequent event in traumatology. "In more than 10,000 dissections of spines reported by Schmorl, he found only two instances of rupture of the intervertebral disk posteriorly. However, in more than 15 percent of this series he found degeneration of the tissues around the lower spine especially, and this involved all the tissues that go to make up this portion of the spine."[18] The trauma that causes a lesion of the normal intervertebral disk in such a manner as to rupture it can result from various causes; for example, from crushing when the subject falls on his feet or buttocks, or suddenly lifts an excessive weight. Another common mechanism of action which may cause trauma is hyperextension of the column, observable after a fall in which the body is supine. A third cause may be found in dislocation of a spinal segment

In traumatic rupture of an intervertebral disk, the annulus fibrosus is torn and the nucleus pulposus extrudes posteriorly or laterally, compressing the spinal cord, cauda equina, or individual nerve root, depending on the level of the injury. With sufficient compression of the spinal cord or cauda equina, paraplegia results. If an individual nerve root is compressed, there is muscle weakness, definite and unequivocal loss of sensation over the appropriate dermatome, and reflex change. Excision of the offending disk is indicated. Whether spinal fusion at the time of disk excision is also indicated, is an unsettled point. Any spinal segment from which a ruptured intervertebral disk has been surgically removed is no longer mechanically or anatomically normal. In any operation for removal of the disk, the dense ligamentum flavum must be removed. This ligament is an important structure which prevents hyperflexion of the spine. In other instances, a surgeon, in exposing the disk, removes some or all of the articular facet with resulting instability. Other changes also occur. These, and the role of spinal fusion in intervertebral disk surgery, will be further discussed in connection with the discogenetic syndrome.

TRAUMATIC RUPTURE OF INTERVERTEBRAL DISK

Case 1. A 29-year-old man was admitted to the hospital on 14 September 1953 with the complaint of low back pain radiating down the posterior aspect of his left lower extremity to the heel. He had experienced sudden onset of the pain while lifting a

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heavy object four months previously. The symptoms lessened with bed rest but recrudesced with weight bearing, and the pain was aggravated by coughing and sneezing. Physical examination revealed tenderness over the lumbosacral joint on the left, and paravertebral muscle spasm with lumbar scoliosis to the right. Lumbar spine motion was limited and painful. Straight leg raising was limited to 30°, on the left and of the right leg to 60°. Neurologic examination showed absence of the left Achilles reflex and weakness of the triceps surae. There was hypesthesia and hypalgesia of the first sacral dermatome on the left. No abnormal neurologic signs were elicited in the right lower extremity. Roentgenograms of the lumbosacral spine showed no abnormalities. After a month of conservative treatment, including bed rest in pelvic traction and local application of heat to the back, there was little improvement. On 13 October 1953 a partial hemilaminectomy of the fifth lumbar vertebra on the left was performed. The annulus fibrosus of the intervertebral disk between the fifth lumbar and first sacral vertebrae was found to be ruptured, with the nucleus pulposus protruding through the rent, tightly compressing the first sacral nerve root. The intervertebral disk was excised. Spinal fusion was not done. The patient became ambulatory 10 days after operation. One month later he had no sciatic pain and only mild back discomfort. The left Achilles reflex had returned, but was hypoactive. The first sacral dermatome hypesthesia was still present. Continuing symptomatic improvement is being shown.

Case 2. A 28-year-old man was admitted to the hospital in July 1952 with the complaint of low back pain radiating down the posterior aspect of his right lower extremity to the heel. He had sustained a back injury from heavy lifting in 1948. Following this, he had had low back pain with sciatica on the right side. In September 1949 a ruptured intervertebral disk had been excised from the fifth lumbar-first sacral level. Except for occasional, mild backache, his symptoms were relieved until March 1952, when back pain and sciatica on the right side recurred. Examination on admission in July 1952 revealed paravertebral muscle spasm, lumbar scoliosis, tenderness over the fourth and fifth lumbar vertebrae, limited straight leg raising, and absence of the Achilles reflex on the right. Extension of the great toe was weak, but no sensory loss was observed. Roentgenographic examination of the lumbosacral spine showed narrowing of the intervertebral spaces at two levels; between the fourth and fifth lumbar, and between the fifth lumbar and first sacral vertebrae (fig. 4). Following an unsuccessful trial of conservative treatment, a myelogram was made which was interpreted as showing a protruded intervertebral disk between the fourth and fifth lumbar vertebrae on the right. At operation in August 1952,

a herniated fourth lumbar disk was found and removed, and spinal fusion of the fourth and fifth lumbar and first sacral vertebrae was done. When the patient was last seen in June 1953, he had no back or sciatic pain, and clinical and roentgenographic examination showed a solid fusion.

Figure 4 (case 2). Roentgenogram showing narrowing of the fourth and fifth lumbar intervertebral spaces.

Case 3. A 30-year-old man was admitted on 9 June 1952 complaining of low back pain radiating down the left lower extremity to the toes. Symptoms began when he lifted a heavy object in September 1951. Examination revealed flattening of the lumbar spine, paravertebral muscle spasm, tenderness over the fourth lumbar vertebra, one-fourth inch atrophy of the left calf, weakness of left great toe extension, and hypesthesia of the fifth lumbar dermatome. The deep tendon reflexes were active and equal. Roentgenograms of the lumbosacral spine, made on 4 April 1952 when he was first seen as an outpatient, showed no

bone or joint abnormality. A myelogram on 11 June 1952 revealed a filling defect between the fourth and fifth lumbar vertebrae. On 18 June 1952, protruded intervertebral disks were removed from between the fourth and fifth lumbar, and fifth lumbar and first sacral vertebrae. Following operation the sciatica subsided, but back pain persisted. He was discharged from the hospital on 21 August

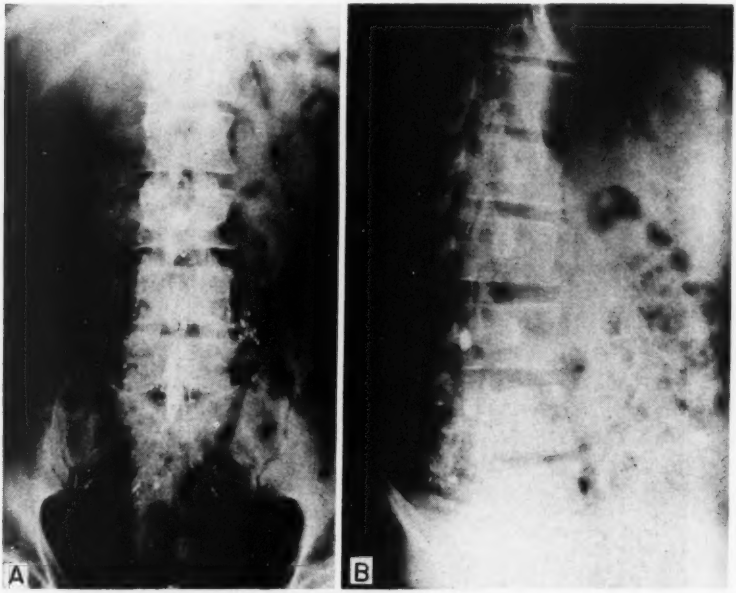

Figure 5 (case 3). (A) *and* (B) *Roentgenograms of the lumbosacral spine, taken five months after excision of the fourth and fifth intervertebral disks, showing narrowing of those intervertebral spaces.*

1952 and was readmitted on 4 November 1952 because of disabling back pain. Sciatic pain had not recurred. Physical findings were essentially the same as on the previous admission. Roentgenograms of the lumbosacral spine showed narrowing of the fourth and fifth lumbar intervertebral spaces (fig. 5). It was concluded that he had traumatic arthritis of the fourth and fifth lumbar and first sacral articular facets, resulting from settling of the vertebrae following herniation of the disk material and from surgical removal of the nuclei pulposi at these two levels. On 2 December 1952, spinal fusion of the fourth and fifth lumbar vertebrae to the sacrum was performed. When last seen in April 1953, the patient was wearing a back brace, but was ambulatory and comfortable. Roentgenograms at that time showed the fusion process to be proceeding satisfactorily.

FRACTURE INVOLVING ARTICULAR PROCESSES

Case 4. A 35-year-old man was admitted to the hospital on 30 April 1953 after sustaining a hyperextension injury of the lower part of his back in an automobile accident. Physical examination revealed tenderness over the fourth and fifth lumbar vertebrae. The patient experienced severe pain on motion of his lumbar spine. Roentgenograms of the lumbosacral spine demonstrated fissure fractures involving the inferior articular processes of the fourth and fifth lumbar vertebrae on the right. A few days later, aching pain developed deep in the right thigh. Symptoms persisted after two months of bed rest. He was encouraged to become ambulatory while wearing a back brace. After three months of hospitalization, he was returned to limited duty. When last seen, six months after injury, he stated that the pain in his back and right thigh was gradually becoming worse. Lumbar spine motion was considerably limited and painful. It is probable that spinal fusion will eventually be required to relieve his symptoms.

As occurred in this case, traumatic arthritis occasionally results from fractures of articular processes, pedicles, and laminae; and spinal fusion may become necessary.

CONGENITAL ANOMALIES

The second group of patients with low back pain in which spinal fusion may be indicated are those in which there is an unstable lumbosacral area which cannot be adequately controlled by conservative measures. The lumbosacral juncture is the part of the spine most vulnerable to mechanical stress and strain. Two primary factors are responsible for this. First, anomalies of the spine are concentrated particularly in the lumbosacral area of the column. The anomalies occur as a result of evolutionary, developmental, or environmental influences. An evolutionary shortening of the vertebral column at the lumbosacral junction is still in progress. Some of the anomalies result in decreased efficiency of the lumbosacral mechanism. Second, all of the weight and movement of the trunk are transmitted from the mobile spine to the fixed base, the sacrum, through the lumbosacral juncture.

Developmental anomalies in the lumbosacral area which make it more vulnerable to daily stresses and strains are:

Spondylolysis and spondylolisthesis. Spondylolisthesis is characterized by a defect in the pars interarticularis of the neural arch. If the defect is in the fifth lumbar vertebra, its most frequent location, there is gradual anterior displacement upon the sacrum of the fifth lumbar vertebra and the superincumbent spine. In spondylolysis, the defect is present but no displacement has

occurred. These anomalies are readily demonstrated in oblique roentgenograms. These are easier to interpret when the neural arch is visualized as a picture of a "terrier." The head of the "terrier" is formed by the pedicle and transverse process, the ears by the superior articular process, the neck by the pars interarticularis, the body by the lamina, and the front and back legs by the two inferior articular processes. When the "terrier" has a collar on, there is defective union at the pars interarticularis without displacement; and when the "terrier" is decapitated, there is spondylolisthesis.

Figure 6 (case 5). Lateral roentgenogram of the lumbosacral spine revealing defects in the pars interarticularis of the fourth and fifth lumbar vertebrae, with second degree spondylolisthesis.

Case 5. A 30-year-old man was admitted to the hospital on 17 October 1951 with a history of chronically disabling low back pain of one year's duration. The onset of pain was spontane-

ous, and there was no history of back injury. He had experienced associated aching down the posterior aspect of both lower extremities. Conservative treatment, including bracing, had not relieved the symptoms to an acceptable degree. Physical examination was essentially negative. Roentgenographic examination of the lumbosacral spine showed bilateral defects in the pars interarticularis of the fourth and fifth lumbar vertebrae, with second degree spondylolisthesis; also, there was lumbarization of the first sacral segment (fig. 6). On 7 November 1951, a modified Hibbs spinal fusion of the third, fourth, and fifth lumbar vertebrae to the sacrum was performed. The result is excellent. He

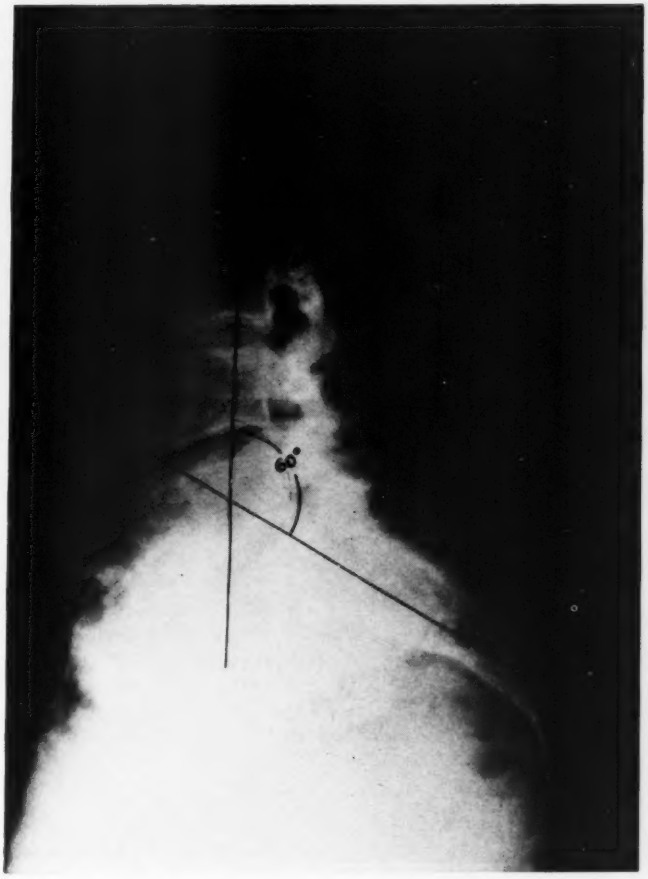

Figure 7 (case 6). Roentgenogram showing increased lumbosacral angle, which measures 60°.

Figure 8 (case 7). (A) and (B) Roentgenograms, taken 25 months following arthrodesis of the transitional vertebra to the sacrum, showing solid bony fusion.

performs all duties without difficulty and his activity is in no way restricted. The fusion is clinically and radiographically successful.

Increase in lumoosacral angle. The lumbosacral angle normally measures 42.5°. When the angle is increased, the line of body gravity is displaced in front of the lumbosacral joint, thus subjecting it to greater stress and in some instances to early traumatic synovitis and capsulitis of the apophyseal joints.

Case 6. A 27-year-old woman was seen in consultation on 13 October 1953 because of nonradiating low back pain of one year's duration. Onset had been insidious and the pain had gradually increased in severity. She had noted that lying in the prone position aggravated the symptoms. Physical examination revealed increased lumbar lordosis. Spine motion was unrestricted, but hyperextension caused pain. Tenderness was elicited over the lumbosacral joint. Roentgenograms showed an increase in the lumbosacral angle, which measured 60° (fig. 7). The patient has been placed on a program of corrective exercises, as advocated by Williams,[19] and postural training. If the lordotic posture is not corrected, traumatic arthritis of the lumbosacral facet joints might result from static mechanical strain, possibly, in later years, requiring spinal fusion for relief of symptoms. Most of these patients, however, obtain relief by conservative treatment, and spinal fusion is rarely indicated.

Asymmetrical or underdeveloped facets of the fifth lumbar vertebra and first sacral segment; transitional lumbosacral vertebra.

Case 7. A 35-year-old woman was admitted to the hospital on 28 September 1951 with a history of nonradiating low back pain of five years' duration. The symptoms were aggravated by ambulation, and temporarily relieved by bed rest. A program of corrective exercises and postural training had produced only moderate improvement. Physical examination showed accentuated lumbar lordosis. Pain was experienced on hyperextension of the lumbar spine. Roentgenograms revealed a transitional lumbosacral vertebra with asymmetry of the lumbosacral facets. On 4 October 1951, spinal fusion of the transitional vertebra to the sacrum was performed with excellent results. The patient now has no symptoms referable to her back. Roentgenographic examination of the lumbosacral spine in November 1953, 25 months after the operation, revealed solid bony ankylosis (fig. 8).

A constantly increased workload is required of the muscles and ligaments supporting an unstable lumbosacral articulation. When their functional capacity is exceeded by stress, strain, injury, chronic postural overwork, or loss of tone and power

Figure 8 (case 7). (A) and (B) Roentgenograms, taken 25 months following arthrodesis of the transitional vertebra to the sacrum, showing solid bony fusion.

with increasing age, symptoms follow. It has been shown that ligamentous structures of the body are the most sensitive to pain.[20-22] Patients in this category have backaches with local signs and symptoms of injury to the vertebral ligamentous structures, and with radiating pain, deep in character, extending down one or both extremities. This radiation, because of a notion that pressure or mutation directly involves the nerve roots, is often mistakenly called sciatica.

DEGENERATIVE CONDITIONS

Friberg and Hirsch,[23] in Sweden, reported on a study of 100 lumbar spines taken from postmortem specimens. The material showed that: (1) Disk degeneration acquired pathoanatomic importance when the annulus fibrosus began to rupture. (2) In the lower lumbar disks, the ruptures in the annulus were mostly localized to the posterior part of the disk; from the center, they were directed, either sagitally or laterally, backward to the intervertebral foramen. (3) Marked degeneration may be present without any radiographic changes: "Thus a normal radiograph does not exclude important degeneration in a disk." (4) When the radiograph showed reduced disk space, sclerosis, or osteophytosis, the corresponding disk was severely damaged. (5) In patients with prolapse of the disk, the structures had the same pathoanatomic characteristics as they did in patients with simple degeneration. Disk prolapse is a part of the phenomenon of degeneration of the disk.

According to Moore,[24] "when destructive or degenerative changes take place, there is relaxation of the supporting ligaments. The intervertebral disk is compressed or loses its turgor and eventually it becomes thinned out. Increased strain is thrown on the apophyseal joints, which in turn become narrowed, traumatic arthritis finally developing in these joints. The spinous processes approach each other and the interspinous ligament is torn or absorbed. The normal lumbar lordosis is increased. The posterior longitudinal ligament relaxes and bulges toward the spinal canal. It may tear and allow protrusion of the nucleus pulposus. The ligamentum flavum is crushed; it becomes fibrosed and thickened and may prolapse forward into the canal. Most important of all, the intervertebral foramen is narrowed and the corresponding nerve root at that location may be constricted or it may be compressed by swelling, by the nucleus pulposus, by the ligamentum flavum, by callus or hypertrophic new bone formation about the apophyseal joints."

Treatment of the discogenetic syndrome, if conservative measures fail, is by spinal fusion. In case there is definite evidence of nerve root compression, laminectomy, with exploration of the intervertebral disk, is done.

Case 8. A 49-year-old woman was admitted to the hospital on 25 September 1951 with a history of recurrent episodes of low back pain of 25 years' duration. Pain had recurred about twice a year, lasting two or three weeks. During the year preceding admission, symptoms had been more frequent and severe, and pain had radiated into the posterior left thigh. Physical examination revealed tenderness over the lumbosacral joint. Motion of the joint was painful but not restricted. Straight leg raising was not limited and neurologic examination was within normal limits. Roentgenographic examination showed marked reduction of the intervertebral disk space between the fifth lumbar and first sacral vertebrae, sclerosis and posterior subluxation of the facets, and contiguous eburnation of the bodies of the fifth lumbar and first sacral vertebrae. On 26 September 1951 spinal fusion of the fifth lumbar vertebra to the sacrum was performed. The result was excellent. The patient now has no significant back pain and enjoys unrestricted activity. Roentgenograms of the lumbosacral spine, taken 19 months after operation, showed solid bony fusion (fig. 9).

Case 9. A 35-year-old man was admitted to the hospital on 7 September 1951 because of severe low back pain radiating into the left lower extremity. Symptoms began in 1943 when he was serving with Marine Corps combat units, although he remembered no specific back injury. Subsequently, back pain recurred repeatedly. Physical examination revealed tenderness over the lumbosacral joint, lumbar scoliosis and limitation of motion, paravertebral muscle spasm, restricted left straight leg raising, and diminution of the left knee reflex. Roentgenograms of the lumbosacral spine showed reduction of the intervertebral disk spaces between the fourth and fifth lumbar, and the fifth lumbar and first sacral vertebrae. There were contiguous eburnation and osteophytosis of the bodies of these vertebrae. At operation on 18 September 1951, the first sacral nerve root on the left was found to be wrapped in dense scar tissue, flattened in caliber, and attached by the scar to the overlying ligamentum flavum. There was no protrusion of cartilage from the disk space, which was entered easily, as no annulus was present. The interspace between the fourth and fifth lumbar vertebrae was also explored, and no disk protrusion was found. Spinal fusion of the fourth and fifth lumbar vertebrae to the sacrum was performed. Following operation, the patient's symptoms were relieved. Roentgenograms taken in December 1952 showed sound bony fusion. When last seen in October 1953, he was performing full duty as a Marine officer without difficulty.

Case 10. A 44-year-old woman was admitted on 7 July 1952 because of pain in the lower part of her back, and in her left thigh and leg. Her first difficulty dated to an injury in 1939, but

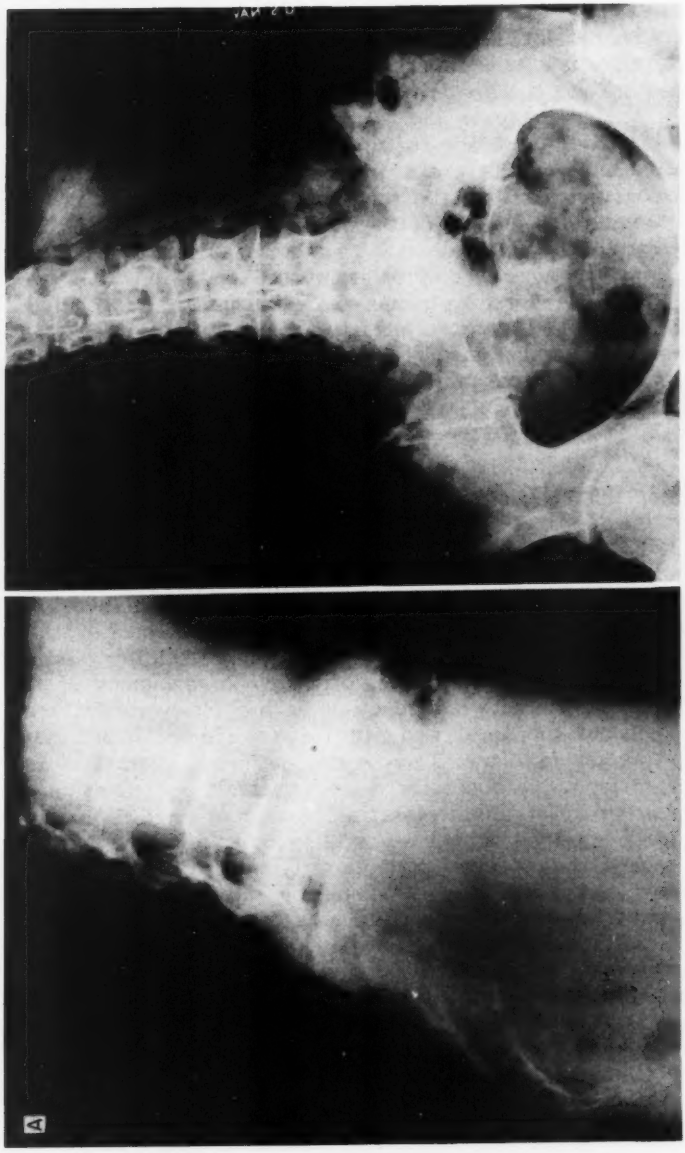

Figure 9 (case 8). (A) and (B) Roentgenograms, taken 19 months after stabilizing operation, showing successful bony fusion of the fifth lumbar vertebra to the sacrum.

her first definite attacks of sciatica began in 1948. She had had several episodes of severe sciatica, relieved by bed rest in pelvic flexion. There had been interludes of freedom from pain while wearing a back support. Examination on admission showed considerable paravertebral muscle spasm, markedly limited straight leg raising on the left, weakness of great toe extension, hypesthesia of the first sacral dermatome, and absent Achilles reflex on the left. With conservative treatment the abnormal neurologic signs disappeared but back pain and sciatica persisted. Roentgenograms of the lumbosacral spine showed diminution of the interspace between the fifth lumbar and first sacral vertebrae, erosion almost to the point of disappearance of the lumbosacral facets, narrowing of the neural foramina, and subluxation of the fifth lumbar vertebra on the sacrum. On 18 September 1952 a spinal fusion of the fifth lumbar vertebra to the sacrum was done, which relieved her symptoms. Roentgenograms taken in July 1953 showed solid bony fusion. At the present time, she has no pain in her back or lower extremities.

According to Bradford and Spurling,[25] patients with symptoms of herniated nucleus pulposus but with little disability rarely need spinal fusion, while those with severe or long-standing disability may well need it. Patients with instability of the lower lumbar articulations, but with no radicular findings and no complete sciatic radiation of pain require fusion alone. In that group of patients with instability of one of the two lower intervertebral disks, plus a history of sciatic pain and objective radicular findings, the intervertebral disk must be exposed during fusion.

That there has been considerable variance of opinion on this point is apparent from a study of the literature. O'Connell[26] reported on a series of 500 operations showing that cure, or at least alleviation of symptoms, was gained by excision and curettage of the disk alone in more than 90 percent of patients. In a series, reported by Love and Walsh,[27] of 100 patients with protruded intervertebral disks on whom operation was performed, it was found neither necessary nor advisable to carry out fusion. Caldwell and Sheppard[28] reported on 151 laminectomies performed, 98 of the patients returning for re-examination. The authors concluded that, in a high percentage of cases, as satisfactory results could be obtained by laminectomy alone as by a combined operation. To them, there did not seem to be any criteria for spinal fusion following removal of the protruded nucleus pulposus. James and Nisbet[29] believed that an increasingly small number of patients with prolapse of an intervertebral disk seem to need spinal fusion in addition to curettage of the disk. Supporting this view, Armstrong[30] considers immediate arthrodesis of the spine at the time of disk excision generally undesirable. The

Research Committee of the American Orthopedic Association,[31] in an end-result study of the treatment of herniated nucleus pulposus by excision with fusion and without fusion, found that the number of satisfactory results from combining excision with fusion was almost 10 percent greater, and that the best results were found twice as frequently in the patients whose spines had been fused. The conclusion was reached, however, that when surgical intervention is necessary for simple cases of herniated nucleus pulposus, the operation of choice is disk excision only.

On the other hand, it is Moore's opinion that every surgical removal of a herniated nucleus pulposus should be followed by immediate spinal fusion. Magnuson[18] and Steindler[32] concur. Barr[33] considers this thesis to be tenable. In Scott's[34] series of disk explorations and spinal fusions, done over a period of seven years, each patient had peripheral signs of nerve root irritation and was relieved by removal of the appropriate spinous process and lamina, followed by spinal fusion. In none was prolapse of disk material found at operation. Scott believed that, provided sound bony fusion is achieved, curettage of the disk is probably an unnecessary procedure.

The mortality rate in simple disk excision and/or spinal fusion is very low. In the series throughout the country, the mortality rate has been consistently less than one percent. Based on statistics derived from operations, most of which were performed during the period from 1935 to 1945, about 15 percent of spinal fusions were found to be unsuccessful. Smith[35] stated that the results of spinal fusion have been excellent or good in more than 80 percent of the cases. According to Peck,[36] complete relief of low back pain can be expected in 70 to 75 percent of patients carefully selected for this operation, 10 to 20 percent will be moderately improved, and 10 to 15 percent unimproved. Bosworth reported that of more than 600 spinal fusions done for all causes at New York Orthopedic Hospital during the five-year period between 1931 and 1935, one or more pseudarthroses occurred in 14 percent of the cases, nearly all of which were subsequently repaired. Of 137 spinal fusions performed by Butterworth,[37] the results obtained were excellent in 22.5 percent, good in 34 percent, satisfactory in 41 percent, and poor in 3.5 percent. Cloward[38] designed an operation in which vertebral body fusion is carried out after the intervertebral disk is removed. Complete cure was recorded in 85 percent of the 262 patients on whom this procedure was done.

It is anticipated that the results of spinal fusion performed during the current 10 years will be even better because of the simplification of the technic by use of "banked" bone as detailed by Toumey,[39] other refinements in technic, and lowering of the infection rate by antibiotic therapy when needed.

SUMMARY AND CONCLUSIONS

Mechanical low back disability is of frequent occurrence, and no one corrective procedure applies to all cases. All possible causes must be considered before deciding upon surgical correction. The cause may be trauma, congenital anomalies, or degenerative changes. The pain mechanisms in low back and sciatic neuralgia have been discussed because of a tendency to regard all such manifestations as caused by a simple protrusion of the nucleus pulposus.

Simple removal of the sequestered or extruded nuclear material often results in relief of acute symptoms, and is probably justified in cases of traumatic rupture of the disk occurring in the years before middle life. If fibrous ankylosis is sufficient, relief from pain may be prolonged; if pain recurs, then stabilization of the back by arthrodesis may give valuable relief.

In patients with severe antecedent back disability, uncontrollable by conservative means, stabilization of the back, with or without nerve root exploration, is indicated.

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PROGRESS OF MEDICINE

Although the history of medicine goes back to the beginning of written speech, there is no part of that five thousand-year story which is so exciting and dramatic as that of the past century. Into this period have been crowded more advances in medical science than in all previous recorded history and, as the years unfold, the pace of progress increases almost in geometrical progression.

— SYDNEY SMITH, M. D.
in *Lancet*, p. 461, Sept. 5,1953

REACTIONS TO PENICILLIN ADMINISTERED ORALLY FOR MASS PROPHYLAXIS OF STREPTOCOCCAL DISEASE

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DURING the winter and early spring of 1952-1953, crystalline penicillin was administered to basic airmen at this base in an effort to reduce the incidence of streptococcal disease. Two groups received 250,000 units orally twice daily for 10 days, and two groups received an equal amount for only 5 days. This article reports the number of reactions encountered, the treatment, and observations as to the apparent effects of the antibiotic on patients with latent fungus disease.

REVIEW OF THE LITERATURE

There have been many reports on the various aspects of penicillin sensitivity resulting from its administration in all forms. Brown[1] reviewed 308 articles covering the period of 1943 to 1948, and the reader is referred to this paper for a complete review of much of the early work on this vast subject. Keefer and co-workers[2] reported 69 reactions out of 500 cases, including chills and fever in 12, urticaria in 14, and headache and facial flushing in 10. Lyons[3] found urticaria the most common single complication (occurring in 5.7 percent of 209 surgical cases). Duemling[4] summarized the results of penicillin in the treatment of 17,879 naval patients for 65 clinical conditions, including 892 patients with neurosyphilis. Ten percent of the total group had Herxheimer reactions, urticaria, pruritus, or fever. Cormia and co-workers[5] reported that of 2,000 Army personnel receiving prolonged treatment with penicillin, 0.5 percent had reactions such as (1) urticaria, complicated by angioneurotic edema, shock, convulsions, and psychotic depression; (2) serum sickness-like syndrome; (3) acute syncope; (4) miliaria-like eruptions; (5) erythemovesicular eruptions which at times simulated dermatophytosis; (6) erythema nodosum; and (7) epididymitis. Thomas and associates[6] found that urticaria was the most common reaction (in 2.5 percent of 10,000 patients). It occurred 7 to 12

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days after treatment had started, and it persisted for from 4 to 5 days regardless of the continuation or discontinuance of the penicillin. Erythematous or papular eruptions were seen in 25 patients within 48 hours after treatment was instituted, and lasted 1 to 3 days. Only 2 patients had a bullous dermatitis. Kern,[7] Goldman,[8] and Kleinfeld[9] reported stomatitis, glossitis, and cheilitis as the result of oral administration of penicillin. Among the many reports of contact dermatitis resulting from handling or local application of penicillin preparations, Goldman and associates[10] reported that of 350 patients treated with penicillin ointment for various cutaneous conditions, 16 had eczematous reactions. The patch test was positive in all but 2 of these, whereas 216 control patients had no positive reactions during a 7-day observation period. When these control patients were retested 2 weeks later, 35 of them had a positive reaction, showing that it was not a primary irritant. Peck and associates[11] skin-tested 406 adults and 91 children with penicillin and trichophytin. Of the 276 adults who had never received penicillin, 15 (5.4 percent) reacted "spontaneously," but none of the 65 children who had had no penicillin reacted positively. The "spontaneous" reactions by penicillin sensitivity were three times as frequent among patients with a positive reaction to the trichophytin test.

Anderson[12] reported one patient who developed purpura associated with transient swelling of the joints and subcutaneous tissue, and a toxic nephritis. Farrington and Tamura[13] and Derzavis and Beinstein[14] reported single cases of severe exfoliative dermatitis from intramuscular administration of penicillin. Kolb and Gray[15] reported seven patients who developed peripheral neuritis from 10 to 21 days after the initial intramuscular injection of penicillin. Broadbent and co-workers[16] also reported four cases of injury to a major peripheral nerve, which they believed was due to toxicity and not from mechanical trauma or pressure on the nerve trunk. Mayer and co-workers[17] reviewed the literature for anaphylactoid reactions and reported six cases. All of these patients had received previous penicillin therapy and four of the six had a history of prior penicillin sensitivity. One patient died. Wilensky,[18] Waldbott,[19] Thomson,[20] and Christenson and associates[21] also reported fatal reactions. Lepper and co-workers[22] reported the incidence of allergic reactions in 1,303 patients as follows: 1.2 percent of 598 patients receiving aqueous penicillin intramuscularly; 2.7 percent of those receiving crystalline penicillin in oil and beeswax; and 1.4 percent of 148 receiving procaine penicillin in oil. They found that reactions were more frequent when a penicillin preparation was administered over a longer time, and that reactions were higher in those who had previous allergies or had previously been treated with penicillin. Gezon and associates[23] gave 125,000 units of penicillin orally daily

and/or sulfadiazine for prophylaxis against streptococcal and nonspecific respiratory infections to about 1,000 naval recruits. They reported that 0.3 percent of these men had dermal reactions varying in intensity from mild pruritus to urticaria severe enough to require hospitalization. Shulman and co-workers,[24] in reporting treatment of penicillin reactions in 13 patients, found that the usual picture was fever, extensive urticaria with erythema, and angioneurotic edema. In nine patients there was a definite history of previous penicillin administration; in the conjunctival sac, intranasally, cutaneously and orally in one patient each, and intramuscularly in the others. The average time elapsed from first administering penicillin until the onset of symptoms was nine days with a range of from one to 14 days. All patients responded rapidly to cortisone given orally or to ACTH given intramuscularly or orally. Samitz and Horvath,[25] in reporting on two cases of acute, severe, exudative dermatitis of intertriginous areas, concluded that penicillin "broadened the base" of allergy to other medicaments. Because of an acute exacerbation of a previous area of dermatitis resulting from penicillin sensitivity, they also believed that cutaneous testing (patch or intracutaneous) was more dangerous than useful. Babione and associates[26] studied several thousand naval personnel using penicillin orally for prophylaxis of gonorrhea. It was not reported how many received penicillin, but some had many exposures and were given either 100,000- or 250,000-unit tablets, depending on the study taking place at that time. There were 37 reactions, 21 of which occurred after the first tablet and all of which were mild urticaria. White[27] also was unable to report the exact number treated because men would repeat their prophylaxis many times, but there were 21 reactions from 23,544 treatments and only one of them was a generalized urticaria. The dose of penicillin was a single 500,000-unit tablet taken orally. The sensitivity rate was about 0.18 percent.

Hopkins and associates,[28] in examining soldiers at an infantry post by clinical inspection, found that 24 percent had typical dermatophytosis and 57 percent were suspected cases. Out of 419 patients examined, fungi were demonstrated microscopically and culturally in 27 percent, whereas 69 percent had positive microscopic findings but had negative cultures. Ajello and coworkers[29] examined 871 men entering military service and found that 522 (59.9 percent) had clinical evidence of tinea pedis. This included the following signs in the percentages indicated: intertrigo in 11 percent; maceration, 31 percent; scaling, 95 percent; fissuring, 25 percent; dyshidrosis, 9 percent; eczema, 3 percent; denudation, 3 percent; and hyperhidrosis, 2 percent. Of those who had signs of fungus disease, 148 (28.4 percent) had positive findings, and cultures were positive as follows: *Tricho-*

phyton mentagrophytes in 17 (32.1 percent): *Trichophyton rubrum,* 28 (52.8 percent); *Epidermophyton floccosum,* 5 (9.4 percent); and *Candida albicans,* 3 (5.7 percent).

THE PROBLEM

Because of the high incidence of streptococcal disease at this base during the early winter of 1952-1953, it was decided to give oral penicillin to a part of the basic trainees, using the rest as controls. Group I consisted of 5,690 men who were given 250,000 units of penicillin twice daily for 10 days (22 through 31 January 1953). Group II consisted of 2,720 men who received the same dose for 5 days (14 through 18 February 1953). Group III numbered 7,612 men and the period of administration was for 5 days (10 through 14 March 1953). Group IV was composed of 17,805 men who received penicillin orally for 10 days (13 through 22 April 1953). All men with acute fungus disease or suspected penicillin reactions were sent to the dermatology section for examination, diagnosis, and treatment. Only recruits with a history of previous sensitivity to penicillin were excused from the course given to their group (table 1). There were no repetitions of treatment in groups I, II, or III, but a small percentage of group IV had received penicillin with group I, although the majority were new men, having replaced those who had completed basic training. Therefore, about 500 men received penicillin orally twice during this study. Because it is the opinion of many dermatologists that the adverse effects of giving penicillin in the presence of fungus disease have been overemphasized in the past, a preliminary survey of about 3,000 basic airmen undergoing medical processing at the beginning of their training was made. The examination consisted of inspection of the feet, hands, and groins of the men to discover evidence of maceration, erythema, cracking, scaling, or other clinical evidence of previous or chronic fungus disease. The acute, severe cases having been screened out prior to arrival at this base, very few were seen with other than mild, chronic manifestations of dermatophytosis. Scrapings and cultures were not taken unless there was serious question of diagnosis or if the patient complained of symptoms. Of this group examined, about 60 percent received penicillin orally.

RESULTS

Of the 3,000 airmen examined for clinical evidence of latent dermatophytosis, 16 percent had evidence of mild, chronic, or latent dermatophytosis, such as erythema, maceration, vesiculation, or pigmentation of the groin; erythema, vesiculation, maceration, scaling, or fissuring of the interdigital spaces or patchy vesiculation or scaling elsewhere on the foot, and/or dermatophytid of the hands. There were 17 patients with symp-

TABLE 1. *Sensitivity reactions to oral administration of penicillin*

Group	I	II	III	IV	Total
Number of men treated	5,690	2,720	7,612	17,805	33,827
Number of days penicillin was given	10	5	5	10	
Patients with reaction	34 (0.6%)	7 (0.3%)	8 (0.1%)	41 (0.2%)	90 (0.3%)
Patients excused	38 (0.7%)	7 (0.3%)	15 (0.2%)	64 (0.4%)	107 (0.6%)
Urticarial reactions					71
Mild	4	0	2	15	21
Moderate	17	3	5	19	44
Severe	2	2	0	2	6
Serum sickness					29
Mild	1	0	0	5	6
Moderate	7	0	0	13	20
Severe	0	1	1	1	3
Other reactions					21
Contactlike dermatitis	4 (a)	0	0	1 (b)	5
Funguslike	5 (c)	2 (d)	1 (e)	4 (f)	12
Erythema multiforme	0	0	0	2	2
Purpuric	0	1	0	0	1
Pityriasis rosea	0	0	1	0	1
Total all reactions					121
Patients receiving penicillin previously	21	4	5	36	66
Patients not receiving penicillin previously	12	2	2	4	20
Patients with previous dermatophytosis	14	3	3	27	45
Patients having no previous dermatophytosis	15	4	5	12	40
Patients receiving no previous penicillin or showing no dermatophytosis	2	1	1	14	18
Patients admitted to hospital	3 (g)	2 (h)	1	15	21 (i)
Patients treated with ACTH	0	1	0	3	4
Patients treated with cortisone	1 (g)	0	0	1	2
Patients treated with ACTH and cortisone	0	1	-	1	2

(a) Two cases of contactlike dermatitis from handling of tablets.
(b) One case of contactlike dermatitis from handling of tablets.
(c) Culture for fungus-negative for five patients.
(d) Culture for fungus-negative for two patients.
(e) Culture for fungus (*Trichophyton gypseum* isolated) one patient.
(f) Fungus cultures were negative in all suspected cases of dermatophytosis.
(g) One admitted twice and received cortisone orally.
(h) Both patients received ACTH. One patient received ACTH on two previous admissions.
(i) Twenty-one patients accounting for 25 admissions.

TABLE 2. *Sensitivity reactions to penicillin orally administered (250,000 units twice daily) to Air Force recruits*

Day reaction occurred	Reaction									
	Fungus-type	Dermatophytid-like	Serum sickness-like	Urticaria	Contact dermatitis	Erythema multiforme	Pityriasis rosea	Purpura	Total	
1	5		2	11	2				20	(30%)
2	2	1	2	3	1				9	
3			2	4	2				8	37
4				1			1	1	3	
5	1			2					3	
6	1		2	4					7	
7			2	3					5	
8			2	3					5	
9			5	6					11	
10			2	9					11	
11		1	2	5					8	(42%)
12	1		1	3					5	
13			2	5					7	
14			3	5		1			9	51

TABLE 2. *Sensitivity reactions to penicillin orally administered (250,000 units twice daily) to Air Force recruits*—Continued

Day reaction occurred	Reaction								
	Fungus-type	Dermatophytid-like	Serum sickness-like	Urticaria	Contact dermatitis	Erythema multiforme	Pityriasis rosea	Purpura	Total
15				1					1
16				1		1			2
17				1					1
18				2					2
19				1					1
20									0
21									0
22									0
23			1						1
24			1	1					2
Total	10	2	29	71	5	2	1	1	121

toms or in whom there was considerable doubt as to diagnosis of dermatophytosis. Cultures from these revealed three cases of *T. mentagrophytes,* one case of *E. floccosum* and one of *T. rubrum*. The other cultures were negative and the patients were not included in the survey. Of the 20 cultures (one to three tubes each) taken on the patients admitted to the hospital for penicillin sensitivity, only one positive culture was obtained (*T. mentagrophytes*). Repeated culture from the webbed spaces of fingers and toes of several of the severe funguslike or dermatophytidlike reactions were repeatedly negative (table 1).

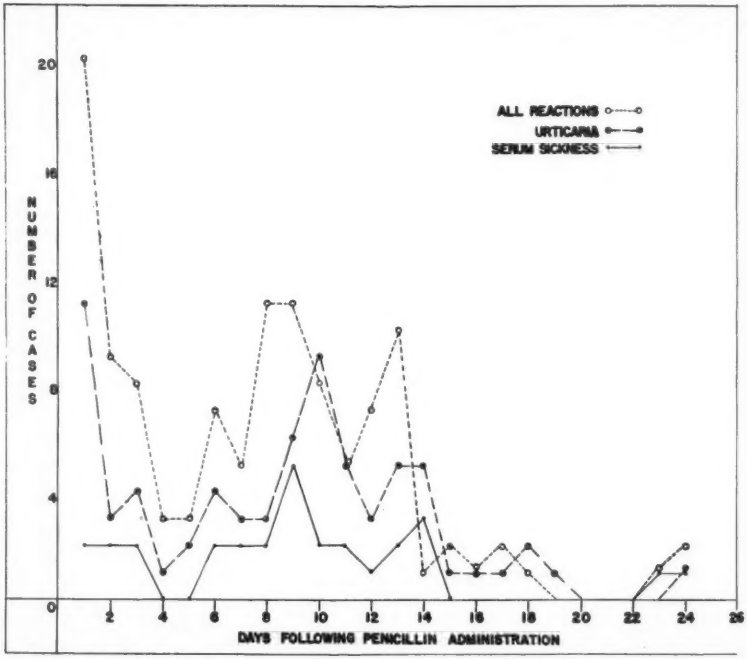

Figure 1. Time of onset of major manifestations of sensitivity to penicillin following administration of 250,000 units twice daily.

The number and types of reactions resulting from the oral use of penicillin in the four groups are summarized in table 1.

Table 2 and figure 1 summarize the time each reaction appeared, considering the beginning of therapy as the first day. It will be noted that 30 percent of the reactions occurred in less than 72 hours, and that 42 percent occurred in from 9 to 14 days.

Table 3 shows the time lost by each patient. The majority were in the hospital seven days or less, there being only 192 patient days for the whole group.

TREATMENT

Twenty-one patients accounted for 25 admissions to the hospital. Four of these patients were treated with ACTH by slow intravenous infusion, two were given cortisone orally, and two had intravenous injections of ACTH followed by a maintenance dose of cortisone orally (table 1). The dose of ACTH was 20 mg. daily for from three to five days, depending on the rapidity of

TABLE 3. *Time lost in hospital as result of severe penicillin reactions after taking penicillin orally*

Days in hospital	Number of patients by groups				Total number of patients from all groups	Total patient days
	I	II	III	IV		
2	1	0	0	1	2	4
3	0	0	0	4	4	12
4	1	0	1	2	4	16
5	0	1	0	1	2	10
6	0	0	0	1	1	6
7	0	0	0	3	3	21
11	0	0	0	1	1	11
15	0	0	0	1	1	15
18	1*	0	0	0	1	18
39	0	1**	0	0	1	39
40	0	0	0	1	1	40
Total	3	2	1	15	21	192

*Total days for two admissions.
**Total days for four admissions.

response. Cortisone was given on a schedule of 300 mg. for the first day, 200 mg. for two days, 100 mg. for from three to five days, depending on response, with a maintenance dose of 75 mg. per day for from five to seven days. The symptoms of all of the other patients with urticaria, serum sickness, or erythema multiforme were controlled by from 50 to 100 mg. of antihistamines (diphenhydramine hydrochloride or tripelennamine hydrochloride)

four times a day and 25 mg. of ephedrine sulfate four times a day for from seven to 10 days. Patients with other reactions were treated symptomatically. The patient who required 40 days' hospitalization was the only one admitted for funguslike disease. Roentgen-ray therapy (375 r of unfiltered, superficial x-ray) was used as an adjunct to local therapy of the vesiculodesquamative dermatitis of the fingers of both hands. Repeated cultures of scrapings from the webbed spaces of this patient's feet and hands were negative for fungi. He gave no history of previous fungus disease, but previously had received penicillin intramuscularly without reaction.

DISCUSSION

Past experience with injections of penicillin in therapeutic doses has resulted in sensitivity of from 0.5 percent[6] to 16 percent,[2] and with penicillin given orally in from 0.3 percent[23] to 0.18 percent.[27] An immediate reaction occurred usually within 48 hours[6] and a delayed reaction, most commonly about nine days after administering the penicillin.[24] The principal reactions reported varied from mild pruritus and erythema to serum sickness, urticaria, angioneurotic edema, exfoliative dermatitis, and anaphylactoid shock.

It will be noted that the majority of our reactions were mild to moderately severe, and that they were fewer in number than usually reported for intramuscularly administered penicillin. It is interesting to note that our rate of 0.3 percent is exactly the same as reported by Gezon for oral penicillin administered to naval recruits. Because both groups were made up of young, healthy, and physically selected males, one might expect fewer reactions, particularly because the total orally given dose of penicillin was relatively low as compared with the therapeutic amounts used intramuscularly for diseases and surgical conditions usually reported. Our results also show an "immediate" reaction within 24 hours, particularly urticaria and funguslike reactions, and a "delayed" reaction about nine or 10 days after first receiving penicillin. Urticaria and serum sickness, in our experience, were much more common than any other reaction, and contrary to other reports, apparent activation of pre-existing fungus disease did not occur frequently. Peck and associates and Cormia and Lewis[30] have indicated, by skin-testing children and adults with penicillin and trichophytin, that prior dermatophytosis had caused sensitivity to penicillin in many patients in the absence of prior administration of this agent. Schnurman[31] reported on five patients in whom, he believed, penicillin had activated latent trichophyton infection. If it had been possible to predict in advance and skin-test with trichophytin and penicillin the 18 patients in this study who had penicillin reactions

but no history of prior penicillin therapy or dermatophytosis, further information might have been obtained on this point. However, because 16 percent of a sample of 3,000 recruits had apparent clinical evidence of fungus disease and five of 17 had positive cultures, but only 0.3 percent of the total group had penicillin reactions, and only one of these had proved activation of a trichophyton infection, we believe that the dangers of giving penicillin in the presence of active fungus disease have been overemphasized. This bears out our clinical impression that penicillin may be given whenever indicated, even in the presence of proved trichophyton infection (*e. g.* treatment of secondary infection of an acute dermatophytosis where laboratory tests show the predominating organism to be most sensitive to penicillin). In general, treatment of patients who had reactions was not difficult; symptoms in all but eight patients were controlled by antihistamines and ephedrine sulfate for a period of from five to seven days. As reported by Shulman and associates and Hensler and associates,[32] ACTH and cortisone readily controlled the reactions not otherwise amenable to the usual measures. We preferred ACTH by slow intravenous infusion to intramuscular administration of ACTH, or to cortisone administered orally or intramuscularly because the dose could be kept relatively much lower, thereby preventing the more common side effects of these hormones.

The question of the number of reactions not seen by a physician in this study was considered. There were undoubtedly cases in which slight erythema or pruritus were not reported, but because of the rigid military control possible with these basic airmen, and because those seen came in small numbers from almost all units, we believe the number missed was very small. There was no way of determining whether in the case of purpura the disease was due to penicillin or to beta hemolytic streptococcus which was isolated from the patient's throat on admission. The patient's laboratory studies revealed no blood abnormalities. The pityriasis rosea may have been a coincidental manifestation also. The two cases of eyrthema multiforme, however, both started as urticaria and soon became classical examples of this condition, and we believe definitely resulted from the oral penicillin.

SUMMARY AND CONCLUSIONS

Penicillin was given orally to a total of 33,827 airmen in an attempt to reduce the incidence of streptococcal disease, two groups receiving 250,000 units twice daily for 10 days and two groups receiving an equal amount for five days. There were 121 reactions in 90 men, the majority of which were urticaria, serum sickness, or a combination of the two.

Five patients had reactions resembling contact dermatitis, and three of these were due to handling the penicillin tablets. Twenty-one airmen were hospitalized; 16 for from two to seven days. Eight of the hospitalized patients were treated with ACTH or cortisone, or both. There were no severe gastrointestinal symptoms and no cases of anaphylactoid shock, convulsions, peripheral neuritis, erythema nodosum, or exfoliative dermatitis.

A preliminary survey of 3,000 basic airmen revealed that 16 percent had clinical evidence of mild, chronic dermatophytosis and of these, about 60 percent were given penicillin orally. Of 12 men with reactions resembling dermatophytosis or dermatophytid, only one had a positive culture for a dermatophyte (*T. mentagrophytes*).

It is concluded that the allergic manifestations resulting from the oral administration of penicillin to healthy young men, in the amounts and during the time of this study, were fewer than anticipated or usually reported for penicillin administered intramuscularly. The results would tend to indicate that the adverse effects of giving penicillin in the presence of latent dermatophytosis have been overemphasized. This study confirms other reports that penicillin reactions occur in immediate and delayed forms; 30 percent occurred in 72 hours or less and 42 percent occurred in from nine to 14 days inclusive. The majority of reactions were mild or moderately severe and were controlled readily with antihistamines and ephedrine sulfate for a seven- to 10-day period. The severe reactions were controlled with ACTH, cortisone, or both.

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A METHOD FOR THE DETERMINATION AND SEPARATION OF PROTEIN IN URINE

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ALL methods commonly used for the determination of protein in urine are dependent on the precipitation of the protein either by chemical agents or by a combination of chemical agents and heat. Some of these, like the ring test with nitric acid and the heat-and-acetic acid method, are of value mainly as screening or qualitative procedures, while the sulfosalicylic acid method and the beta-aminosulfonic acid method generally are considered to be sufficiently accurate for the semiquantitative estimation of protein in urine for clinical purposes. These accepted methods may precipitate constituents other than protein, however, and allow confusing discrepancies when comparative tests are run. Furthermore, the nature of the recovered protein usually is unsuitable if more detailed studies are desirable.

The method described here is a preliminary report of an extremely simple procedure for the determination and separation of protein in urine. It can be used for preliminary screening, as well as for semiquantitative or quantitative purposes.

This method is based on the protein-precipitating property of sodium tetrametaphosphate, which we recently reported[1] for the separation of protein fractions of various biologic systems such as human blood plasma and serum. This property of sodium tetrametaphosphate is activated when the hydrogen-ion concentration is properly adjusted. The addition of the reagent alone to a protein-containing specimen of urine produces no visible precipitation, but when an acid or an acid salt also is added to acidify the urine to a hydrogen-ion concentration of four or lower, the native protein in the urine is precipitated. By adjustment of the hydrogen-ion concentration in steps, fractional precipitation may be obtained. This method is equally effective for dilute and concentrated protein-containing specimens. Furthermore, as in the

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case of the other biologic systems, no substance in urine but native protein reacts with the tetrametaphosphate.

METHODS

To perform a screening or semiquantitative test, 1 ml. of urine, cleared by filtration or centrifugation, is measured into a small test tube. About 50 mg. of the powdered sodium tetrametaphosphate reagent* then is added and the mixture shaken. In the presence of protein, turbidity is visible within a minute or less and precipitation a few minutes later. Because the degree of turbidity and the amount of precipitate are proportional to the amount of protein in the urine, visual approximations are sufficient for screening or semiquantitative purposes, and side-by-side comparisons with permanent standards are unnecessary.

TABLE 1. *Quantitative determination of protein by sodium tetrametaphosphate reagent when varying amounts of human serum albumin were added to pooled normal urine*

Mg. of albumin added per 100 ml. of urine	Mg. of albumin recovered per 100 ml. of urine	Mg. of albumin added per 100 ml. of urine	Mg. of albumin recovered per 100 ml. of urine
10	9-11	90	89-91
15	15-16	100	98-102
20	19-22	150	147-153
30	28-31	200	199-204
40	39-42	250	246-253
50	50-52	300	296-303
60	58-60	350	345-354
70	68-71	400	396-405
80	79-82	500	495-510

When reading a test, the test tube is held against a dull background and viewed by indirect light, so that the slight turbidity and precipitation obtained with concentrations of protein of less than 10 mg. per 100 ml. may be detected easily. If large amounts of protein are present, the urine may be diluted with water in appropriate proportions, and the dilution factor taken into account in calculations. Even though the concentration of urine is thereby reduced, this test demonstrates protein quantitatively over the wide range usually encountered.

*The sodium tetrametaphosphate reagent, containing a balanced proportion of sodium tetrametaphosphate and an acid, was supplied under the trade name Protinur by Diagnostic Aids, 29 Commonwealth Ave., Boston, Mass.

TABLE 2. *Quantitative determination of protein by sodium tetrametaphosphate method when varying amounts of human serum albumin were added to urines containing protein*

Mg. of protein per 100 ml. of urine	Mg. of albumin added per 100 ml. of urine	Mg. of protein recovered per 100 ml. of urine	Mg. of protein per 100 ml. of urine	Mg. of albumin added per 100 ml. of urine	Mg. of protein recovered per 100 ml. of urine
10	10	19-21	50	10	57-61
10	15	23-26	50	15	63-65
10	20	29-32	50	20	68-71
10	30	39-41	50	30	77-82
10	40	49-52	50	40	88-92
10	60	69-72	50	60	108-112
10	80	88-92	50	80	126-134
10	120	127-132	50	120	166-172
30	10	38-41	75	10	83-87
30	15	45-47	75	15	87-89
30	20	49-51	75	20	93-99
30	30	57-62	75	30	99-104
30	40	68-72	75	40	110-115
30	60	87-92	75	60	130-136
30	80	107-112	75	80	150-152
30	120	146-154	75	120	190-194

To perform a quantitative test, measured amounts of cleared urine, ranging from 1 to 3 ml., and about 50 mg. of the powdered reagent for each 1 ml. of urine are placed in a graduated centrifuge tube similar to the 3 ml. Kimble No. 46815 centrifuge tube. This is graduated from 0 to 0.4 ml. in 0.004-subdivisions and from 0.5 ml. to 3 ml. in 0.1 ml.-divisions. The tube is agitated until solution occurs, and allowed to stand for a few minutes in order to permit complete precipitation. Then it is centrifuged for 10 minutes at about 2,000 r. p. m. and the amount of precipitate determined. The values obtained in this manner have been comparable with those of sensitive analytic procedures.

Effervescence appears in any urine having an original pH above 7.2. In protein-containing urines, precipitation occurs after the effervescence has subsided. Because the appearance of effervescence in urine specimens treated with the sodium tetrametaphosphate reagent signifies alkalinity, this reagent may also be considered an indicator of an alkaline or acid urine, depending on whether or not effervescence is observed.

RESULTS

Over 7,500 examinations of urine for protein content have been carried out by this method. By its use protein concentrations as low as 5 to 10 mg. per 100 ml. urine were regularly detected. Electrophoretic analyses of the precipitate obtained with this procedure indicated that the precipitated protein was composed largely of albumin. Because no substance in urine other than native protein was found to react with the tetrametaphosphate reagent, the reagent appeared to have a specific action for such protein.

In order to test further the specificity of the sodium tetrametaphosphate method, known amounts of human serum albumin were added to samples of normal urine, which were then treated with the reagent. The amount of albumin precipitated, as measured quantitatively, was found to be the amount introduced, within the limits of error (table 1). When known amounts of human serum albumin were added to specimens of urine having varying amounts of protein, the combined amounts were recovered quantitatively (table 2).

Hydrolyzed proteins, peptones, proteoses, and amino acids failed to react with the tetrametaphosphate reagent.

SUMMARY

A simple and rapid method for the determination and separation of protein in urine, requiring only 1 ml. of cleared urine and 50 mg. of a dry sodium tetrametaphosphate reagent, is described.

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The sodium tetrametaphosphate reagent employed appears to be highly specific for protein and may be used either for screening purposes or for semiquantitative or quantitative measurements.

This preliminary study offers a new and accurate approach to the determination and separation of protein in urine.

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A CO-WORKER SPEAKS OF EHRLICH

Paul Ehrlich was a man not only of rare scientific genius but of a very unusual personality. His waking thoughts and attention were concentrated upon his scientific activities and speculations with a burning intensity. Any visitor, if he could be thought to have some kind of contact with such interests, was likely to find himself abruptly plunged into a flood of enthusiastic and exclamatory exposition, though he could hardly fail to retain some stimulus and inspiration from the immersion. Within his special range Ehrlich's knowledge was profound and comprehensive, and his memory prodigious; but beyond the sharply drawn limits of that range he made no secret, but rather a parade, of the astonishing completeness of his ignorance. Anything electrical, for example, was entirely beyond his ken, and he would confess to, or boast of, his inability to remember the direction of the earth's rotation. Apart from his unremitting concentration on his scientific work, his small remainder of interests and activities had a remarkable simplicity.

He seemed to read very little outside his own scientific range. I have heard him speak with enthusiasm, indeed, of the Sherlock Holmes stories, and a portrait of Conan Doyle hung on his study wall; but that was because he prided himself on a supposed resemblance between Holmes's detective methods and those of his own researches. His tastes in the fine arts were those of a child; and there were many other childlike aspects of his character. He had no trace of the pomposity which men of his eminence in the Germany of those days were apt to display; and his freedom from many normal inhibitions could be endearing or exasperating, according to the circumstances. He seemed to be generous and petty, open-hearted and secretive, culpably careless of his own interests, and fiercely, explosively resentful of anything which he felt as an encroachment, or even as unfair criticism—all in turn and unpredictably. His character seemed, indeed, to have a heavy dose of what is commonly called the artistic temperament, but without any faculty of artistic appreciation.

—SIR HENRY DALE,
in *British Medical Journal*, p. 663,
Mar. 20, 1954

USE OF CALCIUM HYDROXIDE AS A PULP CAPPING MATERIAL

A Clinical Study in Young Adults

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THE history of the management of carious teeth with pulps exposed indicates that dentists have long favored pulpotomy.[1,2] Since 1938 the use of calcium hydroxide as a pulp capping material[3,4,5] to avoid pulpotomy has been reported. Glass and Zander,[3] who demonstrated pulp healing in four weeks, using calcium hydroxide, noted that absence of symptoms did not necessarily indicate healing had taken place.

In our experience, a high degree of success was obtained following pulp capping with calcium hydroxide. The patients treated were young adults, between the ages of 19 and 23 years with an average age of 20.03 years. Because much of the previously reported work had been done on children[6] we believed that results in an older age group should be analyzed. The 24 dentists participating in this study selected patients on the basis of the history and clinical appearance of the teeth.

PROCEDURE

The procedure was as follows: When pulp tissue was exposed the tooth was protected by cotton rolls from further contamination by saliva, and the remaining caries were carefully removed. After the cavity preparation was completed, the pulp was capped with a workable mixture of tap water and calcium hydroxide (fig. 1). Where necessary the excess moisture was dried by gentle application of warm air or by a pledget of cotton without compressing the pulpal tissue. Then a base of oxyphosphate of zinc cement was applied. If time permitted, a permanent filling was then placed, otherwise oxyphosphate cement was the only material used for temporary filling, and part of it was left in place when a permanent filling was placed at a subsequent visit. Each tooth so treated was examined roentgenographically, and teeth which failed to present a normal appearing alveolar process around the root ends, or showed evidence of periodontoclasia or mechanical failure, were eliminated from the

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study. The radiologic examinations were done by the same dentist throughout the test. The dentist treating the patient recorded the presence or absence of pain previous to the operation, the prognosis, and the treatment given and evaluated the results.

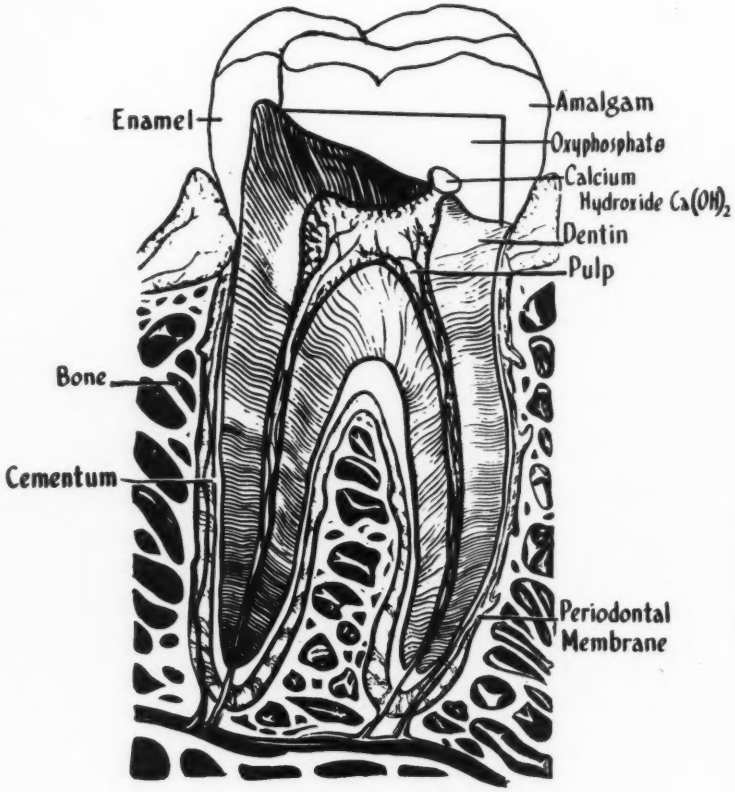

Figure 1. Diagrammatic sketch.

METHOD OF TESTING

Of about 225 teeth treated by this method in four months, only 52 could be tested clinically and radiologically in a follow-up study. Healing of the tooth pulp was considered to have taken place if the patient's reaction to heat and cold stimuli in the treated tooth was the same as in the adjoining teeth of the same tooth group. The electric pulp tester was not used because most of the restorations were large, in proximity with the gingiva, and adjacent to other metallic restorations. Radiologically, the in-

TABLE 1. *Postoperative results in anterior teeth*

Case number	Time (months) between operation and postoperative check	Preoperative pain	Prognosis at operation	Radiographic evidence of dentinal bridge
1	Failure	Undetermined	Undetermined	Periapical abscess
2	4	Undetermined	Undetermined	Yes
3	4	None	Good	No
4	4	None	Good	No
5	3	None	Good	No
6	2	Undetermined	Undetermined	Yes
7	2	None	Good	Yes
8	3	Undetermined	Poor	No

TABLE 2. *Postoperative results in bicuspid teeth*

Case number	Time (months) between operation and postoperative check	Preoperative pain	Prognosis at operation	Radiographic evidence of dentinal bridge
9	3	None	Good	Yes
10	3	None	Good	No
11	3	None	Good	Yes
12	4	Undetermined	Undetermined	Yes
13	3	None	Poor	No
14	4	None	Poor	Yes
15	3	None	Good	No
16	3	Yes	Poor	Yes
17	2	Yes	Good	Yes
18	4	Yes	Good	No
19	3	Undetermined	Undetermined	No
20	4	Yes	Good	No
21	3	Yes	Poor	No
22	2	None	Poor	No
23	4	None	Good	No
24	4	None	Good	Yes
25	4	None	Good	Yes
26	2	None	Poor	Yes

TABLE 2. *Postoperative results in bicuspid teeth*—Continued

Case number	Time (months) between operation and postoperative check	Preoperative pain	Prognosis at operation	Radiographic evidence of dentinal bridge
27	3	None	Good	No
28	4	Undetermined	Undetermined	Yes
29	3	Yes	Good	No
30	3	Undetermined	Undetermined	No
31	1	None	Good	No

volved teeth were examined for evidence of dentinal bridge formation[7] or change in alveolar structure. Teeth which showed a thickening of the lamina dura or evidence of hypercementosis were not considered failures; however, a break in the lamina dura or a widening of the periodontal membrane was considered a retrograde change.

RESULTS

The statistical results of this treatment in 52 teeth with a minimum of a 30-day follow-up period are shown in tables 1, 2, and 3. Several points are not self-evident in these tables.

The 30-day minimum period applied only to three teeth. Forty-nine treated teeth were examined from 60 to 120 days after the operations were performed. Of the 52 teeth involved, 21 were molars, 23 were bicuspids, and eight were anterior teeth with single pulp canals. We believe these statistics represent the average number of single canals in relation to the average number of multiple canals encountered in operative dentistry, and from this conclude that the difference between single or multiple canals had no effect on the results of this study. The response to heat and cold was normal in the 50 teeth successfully treated.

Pain, which may suggest some retrograde change within the pulp, was present in 14 teeth prior to treatment. In empirical dentistry this is an indication for tooth extraction, but this was not always true in our patients. The vitality of the tooth, type and nature of the hemorrhage, size of the pulpal exposure, and the ability to protect the field from further contamination are more important factors in the prognosis than the history of pain. Twenty-five teeth in our patients were treated successfully, although the prognosis was poor in 14 because of pain, and undetermined in 11 other teeth for various reasons.

Postoperative roentgenograms[8] in comparison to preoperative ones showed a periapical abscess in teeth noted as failures in tables 1 and 3; 20 teeth showed evidence of dentinal bridge formation. It was a disadvantage that we were not able to standardize preoperative and postoperative radiography in relation to the position of the patient, length of exposure, time of development, and temperatures of the chemical solutions. In preparing the statistics it was discovered that a treatment failure (case 1) occurred in an anterior tooth in the same patient who had a successful (case 2) pulp capping. Likewise another patient had a success (case 42) and failure (case 41) of a pulp capping of posterior teeth. Of the 52 teeth receiving $Ca(OH)_2$ pulp capping, 50 observed were clinically successful.

The principal reasons for choosing the simple method which was employed are:

1. This study was intended primarily to test the success of the material in a young adult group. Inclusion of any other material would be unnecessary in the light of previous investigation, and would add to the difficulty in controlling the experiment; therefore, drugs commonly used in sterilizing cavities, as well as zinc oxide and eugenol, were omitted.

2. Some investigators have come to believe that calcium hydroxide inactivates the antibiotic drugs in their metallic salt forms, with the exception of oxytetracycline (terramycin).

3. The merit of calcium hydroxide in stimulating repair has been reported. Some investigators believe that the hydrogen concentration of the material causes it to be both bacteriostatic and bacteriocidal.[9] Under the conditions within the dentinal walls, it is possible that the material presents a favorable hydrogen ion concentration for repair which may be more important than in other structures.

4. Oxyphosphate of zinc cement placed immediately over the fresh mixture of calcium hydroxide produces tribasic calcium phosphate, which is an integral part of calcified dentin. If the exposed area is overlaid with a large amount of a semihard substance such as fresh zinc oxide and eugenol mixture, the mixture may be compressed into the pulp chamber when the cement base and permanent filling material are applied.

5. In this study a permanent restoration was inserted, in most cases immediately following pulp capping, thereby avoiding subsequent mechanical injury due to displaced filling material, et cetera.

SUMMARY AND CONCLUSION

Of 225 teeth treated with calcium hydroxide as a pulp capping material, 52 were available for clinical and radiographic observation for from 30 to 120 days. As an aid in control and evaluation, only oxyphosphate of zinc cement was used as a filling or filling base in these teeth, and no sterilizing drugs, zinc oxide, or eugenol were used in treatment. Of the 52 teeth treated, the results in 50 were considered to be clinically successful; two teeth gave radiographic evidence of a periapical abscess. Although the prognosis was undetermined or poor in 25 teeth the results in all but one were clinically successful; the second failure occurred in a tooth with a good prognosis.

These findings indicate that the use of sterilizing drugs, zinc oxide, and eugenol is not essential in the treatment of exposed

TABLE 3. *Postoperative results in molar teeth*

Case number	Time (months) between operation and postoperative check	Preoperative pain	Prognosis at operation	Radiographic evidence of dentinal bridge
32	2	None	Good	Yes
33	2	None	Good	No
34	4	Yes	Poor	Yes
35	3	None	Poor	Yes
36	3	None	Poor	No
37	3	None	Good	No
38	2	None	Good	Yes
39	4	Undetermined	Undetermined	No
40	3	None	Poor	Yes
41	Failure	Yes	Good	Periapical abscess
42	3	Undetermined	Undetermined	No
43	3	Yes	Poor	Yes
44	3	Yes	Poor	No
45	2	None	Poor	No
46	4	Yes	Good	No
47	4	Yes	Good	No
48	3	Yes	Good	No
49	1	None	Good	No

TABLE 3. *Postoperative results in molar teeth*—Continued

Case number	Time (months) between operation and postoperative check	Preoperative pain	Prognosis at operation	Radiographic evidence of dentinal bridge
50	1	None	Good	No
51	2	Yes	Poor	No
52	2	Undetermined	Undetermined	Yes

pulp, and that the use of calcium hydroxide is adequate, resulting in rapid healing of pulpal tissue in the young tooth.

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D-AMPHETAMINE SULFATE IN OBESE HYPERTENSIVE PATIENT

This study was conducted on 148 obese, hypertensive patients to determine the immediate and long-range blood pressure effect of orally administered d-amphetamine sulfate and the immediate effect of intravenous administration of the drug on blood pressure, heart rate and peripheral circulation. Placebo therapy was used as a control.

The results show that: 1. Prolonged use of oral dexedrine sulfate does not affect the long-term blood pressure in obese hypertensive patients. There is a mild, transitory immediate increase in blood pressure, which occurs similarly with placebos, but which is seldom greater than pressures recorded prior to the study.

2. Intravenous dexedrine results in a slight unpredictable rise in blood pressure and a moderate, transient peripheral vasoconstriction. There is no relationship between these findings, nor between them and the occasional decrease in skin temperature that occurs. There is no effect on heart rate, nor are there subjective side effects.

3. Dexedrine consistently reduces the appetite, but weight loss does not occur without definite dietary restriction.

—ELLIOTT L. GOODMAN, M. D., and
EDMUND L. HOUSEL, M. D.
in *American Journal of the Medical Sciences*,
p. 253, Mar. 1954

DIFFERENTIAL DIAGNOSIS OF PSYCHOGENIC HEADACHE

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THE magnitude of the problem of headache has long been recognized and many studies have shown that this condition is the most common of patients' complaints. In a survey cited by Wolff,[1] eight percent of the men examined for induction into the armed services during World War II had "frequent severe headaches." Its incidence as one of the presenting complaints of patients seeking medical assistance is even higher.

The problem of headache is also one of extreme complexity. Barton and Yater[2] differentiated 45 diagnostic entities (not including "less common causes," neck pain, and various psychiatric causes) capable of causing headache. Within recent years the immediate mechanisms in the production of headache[1] have been greatly clarified, but such factors as the simultaneous operation of more than one mechanism and the nature of their ultimate cause complicate the problem.

The diagnosis and management of patients with headache is of especial significance in the military medical services, because administrative, economic, and morale factors are involved to a greater extent than in civilian practice. An example of this interrelationship was that 50 percent of the men in the armed services during World War II, who gave significant demonstration of their unsuitability, complained of headache.[1] A survey of the incidence of this condition as a presenting complaint of airmen who were outpatients at this base for one month (3,796 patient visits during this period) showed that headache was given 474 times (12½ percent) as one of the presenting complaints and 167 times (4½ percent) as the chief complaint.

This report is confined to those headaches which are "psychogenic," *i. e.*, those having emotional factors of considerable significance as the cause. It also includes certain conditions having etiologically significant somatic factors as well. (The exact proportion of patients with headaches in this psychogenic category could not be determined, but the physicians conducting sick call estimated it to be about 80 percent of the total.)

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Despite recent research on the subject it is still not an uncommon practice to begin the differential diagnosis of the complaint of headache with three common concepts of headache, "organic," "psychogenic," and "malingered," and, in the latter two, to end it there. These concepts may be defined as follows: a headache with demonstrable pathology is "organic"; one without such findings is "psychogenic"; and one involving an element of personal gain is "malingered." Such an approach is superficial and fallacious, involving the possibility of serious errors in treatment, administration, and research.

Before reviewing the differential diagnosis of psychogenic headache, an outline of the components of a thorough evaluation of such a patient (in addition to the complete physical examination and indicated laboratory procedures) may be useful.

1. History of the present illness: (a) exact description of headache as to location, quality, severity, duration, variability, and concurrent physical and psychologic status; (b) frequency and timing of headaches; (c) exact statement as to time, place, circumstances, and mode of onset of the first headache; (d) careful search for precipitating factors of significance; and (e) description of other symptomatology of the present illness, noting relationship to the headache.

2. Mental status examination.

3. Personal history with emphasis on emotional factors.

4. Family history, noting not merely the presence or absence of the complaint of headache, but the type and timing of such headaches and the patient's reaction to them and to the relatives concerned.

5. Psychologic studies, particularly projective tests.

Conditions which often involve the presenting complaint of headache and which have emotional factors of great significance in their cause must include the following entities: conversion hysteria, anxiety neurosis and anxiety reactions, neurasthenia, organ neurosis: migraine and "tension headache," hypochondriasis, depression, schizophrenia, malingering, combinations of the above, and headaches having a primary organic cause but complicated by one of the above.

These diagnostic entities will be briefly reviewed, with more detailed attention given at the end of this report to the problems of differentiation involved in conversion hysteria, organ neurosis, and malingering.

DIAGNOSTIC ENTITIES

Conversion hysteria. There is considerable variation in the nature and frequency of conversion headaches, simulating other

disease entities. Frequently the patient's affect will afford a useful lead. He may display the oft-mentioned *belle-indifference* toward pain he is describing as very severe. His affect may be one of anxiety rather than suffering, or his expression of suffering may tend to be theatrical. He may appear less ill physically than a patient with migraine or depression. Suggestive evidence would include uncovering an emotionally stressful experience that coincided temporally with the onset of headache in a person whose basic personality structure was hysterical. The decisive element in making the diagnosis, however, is the discovery of a specific symbolic meaning in the symptom.

Anxiety neurosis and anxiety reactions. These terms refer to varieties of the same condition, the former being used when the condition is relatively chronic and deep going, and the latter when it is more acute and superficial. The type of headache involved is very similar to that described for neurasthenia. There is a more or less constant feeling of tension and uneasiness, but in addition anxiety spells, characterized by shortness of breath, palpitation, rapid pulse, and an emotion similar to fear but without any rational object, occur at intervals.

In patients with uncomplicated cases of neurasthenia and anxiety neurosis the history usually reveals current inadequate discharge of sexual tension. Unlike the hysterical headache, the headache in these conditions has no symbolic meaning, but is a symptom of widespread muscular tension associated with emotional conflict,[3] and thus is in the same category as backache and constipation which are also frequent complaints in neurasthenia.

Neurasthenia. Patients with neurasthenia often complain of a feeling of pressure on the head and sometimes of an aching in the occipital and nuchal region. Fatigue, irritability, restlessness, impaired efficiency, and other concomitant symptoms of neurosis must be apparent to support the diagnosis of neurasthenia.

Organ neurosis. In some respects the neurasthenic-anxiety neurotic group of conditions and the organ neurotic group form a continuum, in which at least three fourths of the psychogenic headaches in the above survey fell. "Tension headaches" are border-zone conditions, occurring in some patients with a typical anxiety neurosis or neurasthenia, and in others appearing physiologically and psychologically more closely analogous to true migraine. The most common locations of "tension headache" are the occipital region, nape of the neck, and temporal region.

Migraine headache is a good example of an organ neurosis, forming a well-defined clinical entity. Both specific attacks and

the underlying readiness for such attacks has been shown to be related to emotional factors.[4,5] Thus the history of a clear-cut emotional precipitating element is not, *per se*, a diagnostic point in favor of hysterical headache as against migraine. The general features of a classical migraine attack are too well known to be repeated. Occasionally a therapeutic trial with a cerebral vasodilator drug in the earliest phase, or a cranial vasoconstrictor in later phases may be diagnostically clarifying.

Hypochondriasis. This disorder is borderline in extent of personality involvement between neurosis and psychosis, often representing an early clinical phase in the development of schizophrenia. Headache may be only one of many complaints. The patient's description of his headache may be rather bizarre, yet it is not so important as his attitude toward the complaint. The unswerving stability of the patient's preoccupation with his symptoms is highly characteristic, as well as the physician's inability to relieve the symptom (except very transiently) by medication, reassurance, or change of regimen. Another valuable diagnostic point is the withdrawal of the patient's emotional investment in persons and objects formerly of interest to him.

Depression. When headache is present in depression, it is usually dull and generalized. In psychotic depression it is characteristically worse in the morning than in the evening. When organic factors have been eliminated, this diurnal variation is the most useful diagnostic characteristic of the headache and has occasionally suggested a correct diagnosis of severe depression when other features have been inconspicuous. This headache does not respond appreciably to drugs other than morphine and benzedrine or their derivatives.

Schizophrenia. In this condition the complaint of headache is also important chiefly in that it may be the first lead presented to the physician. The "flavor" of the patient's complaint and its significance in his total mental economy are very similar to the situation in hypochondriasis, but are carried a step further due to further personality disintegration. There is often a very bizarre quality to the complaint of headache in a patient with schizophrenia. He may, for example, say that his head is exploding or about to explode, that his brains are being dissolved by acid, or that they have drained into his testes and been discharged as semen. The complaints may be hallucinatory or delusional, or qualified by a half believed "it feels as if."

Malingering. This area is of particular significance in the military patients. The complaint of headache by a malingerer is not uncommon, and its immediate motivation ranges from trying to avoid kitchen police duty to the desire for separation from service with compensation. As a rule the complaint is advanced more

forcefully than specifically. Malingering frequently appears as an exaggeration of a genuine though mild sensation of headache of any cause. In addition to the elimination of other conditions commensurate with the severity of the alleged headache, the diagnosis of malingering depends on the demonstration of a motive plus a certain underlying character structure.

Headaches, on the basis of the simultaneous operation of more than one of the above conditions or of one of these conditions plus organic disease, are quite common. The warning derived from this observation is that the discovery of one causative chain should not eliminate others from consideration.

Probably the most difficult differential diagnoses in the group of psychogenic headaches are those involving conversion hysteria, organ neurosis, and malingering.[6] Hysteria occupies a pivotal position, having major features in common with each of the others. The patient with conversion headache and the one with organ neurotic headache both present somatic complaints having unconscious emotional conflicts as significant causative factors. The patient with conversion headache and the one with malingered headache both present complaints having a specific purpose or meaning.

ABSTRACTS OF CASES

Case 1. A 20-year-old airman was referred to the neuropsychiatric clinic from the ear, nose, and throat clinic. His presenting complaint was severe, nearly continuous frontal headache, worse on the left, of abrupt onset and of six weeks' duration. The daily variations in intensity were typical of the headache of frontal sinusitis, but clinical examination, laboratory studies, and skull roentgenograms revealed negative findings.

Past history revealed that the patient's father, a stern and forbidding figure, suffered from sinusitis attended by left frontal headache. On the evening preceding the onset of the headache the airman had had a severe argument with his father concerning the airman's misconduct with a woman. Although the father had been equally unrestrained in his youth, he demanded totally different behavior from his son. Since the argument the patient had not seen his friend, saying that he felt too ill to enjoy going out.

Case 2. An 18-year-old airman was referred from sick call with the complaint of headaches, each of several hours' duration, which had occurred several times a week during the preceding month. The headache was localized in the occipital region. The only positive physical finding was a moderate increase in tone of the posterior neck muscles.

Past history revealed that the period of one month coincided with the time during which the airman had been attending a tech-

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nical school. The patient was doing passing work but with considerable difficulty. He intended to make the best of things but did not enjoy the work, resented the assignment, and had both anxious and hostile feelings toward certain of his instructors (of which he was only partially aware). The patient had had similar feelings toward a civilian employer and his father, but had handled these situations by changing jobs and avoiding much contact with his father.

Case 3. A 20-year-old airman, also attending a technical school, was referred to the neuropsychiatric clinic with the complaint of continuous, generalized headache of increasing severity and of 10 days' duration which he described as "terrific." All physical and laboratory findings (including electroencephalographic, spinal fluid, and roentgenographic studies, were negative.

Psychologic tests revealed a pattern typical for psychopathic personality. Prior to the patient's first complaint of headache he had attempted to obtain a hardship discharge which had been denied on the basis of insufficient and somewhat fraudulent grounds.

The clinical diagnoses of these patients were conversion hysteria, organ neurosis, and malingering, respectively. In case 1, the specific meaning of the symptom was "I want to be like my father, taking what I want from women, but I am afraid to do this because of his anger." Case 2 also displayed emotional conflicts, but here the symptom had no specific meaning in the above sense. It was based on chronic muscular tension, which derived from chronic emotional conflicts, but it did not express or partially solve these conflicts as did the hysterical headache.

In case 3, the presenting complaint had a purposeful meaning, namely, "I want to get out of the service," and in this respect resembled the complaint of the patient with conversion headache. A major difference is that the hysterical patient used the psychologic mechanism of *repression,* whereas the malingerer did not. The meaning of the symptoms in the hysterical patient was unconscious, whereas that of the malingerer was conscious. As a corollary, the hysterical patient, unlike the malingerer, actually experiences pain.

Aside from the scientific satisfaction of making an accurate diagnosis, there are numerous implications both for medical treatment and administrative handling inherent in such differentiations. Many of the following mistakes can be avoided. (1) The physicians will not conclude that a symptom is malingered merely because *he* can see a purpose behind it. (2) He will not waste time making symbolic interpretations to a patient with an organ neurosis in an attempt to effect a quick remission of symp-

toms. (3) He will not lightly dismiss as "psychogenic" a headache which might be the first or foreground symptom of an underlying malignant personality disorder such as hypochondriasis, depression, or schizophrenia. (4) He will not embark on a long trial of medications or of intensive psychotherapy in a neurasthenia without first testing the result of relatively simple measures.

In addition, an awareness of the complexity of the problem of psychogenic headache will render the physician less confused, discouraged, and thwarted in his therapeutic efforts. The following case offers an example of this complexity and its management.

Case 4. This patient was an attractive, strong-minded, 41-year-old woman, referred to the neuropsychiatric service from the dependent's clinic. Her chief complaint was of severe right hemicrania, preceded by transient visual difficulties, lasting from six to 12 hours, and usually relieved only by sleep. The attacks averaged two per week, and the duration of the illness was about 12 years. The patient had not previously consented to a thorough medical evaluation.

The clinical picture resembled that of migraine and the patient was given dihydroergotamine methanesulfonate (dihydroergotamine (D. H. E. 45)) with prompt but somewhat unexpected results. In about one-third of the headaches experienced, the severity was drastically reduced. The patient could not predict which of the headaches would respond to the medication.

The original psychiatric evaluation had indicated a fairly severe personality disturbance related to an unhappy early relationship with a coldly intellectual mother, also afflicted with headaches, an ambivalent relationship with a somewhat seductive father, and strong feelings of unsuccessful rivalry with an older and a younger sister. It was now suspected that the remaining headaches, simulating the migrainous ones, were of an hysterical nature. A period of expressive psychotherapy was instituted, having the limited goal of amelioration of the distressing symptoms. This result was largely achieved, and it was also found that the incidence of the migrainous headaches was reduced.

Any attempt to relieve these symptoms by medication or psychotherapy alone, unless very intensive and prolonged, would have failed.

SUMMARY

The magnitude of the problem of headache in general and of headache related to emotional factors in particular is stressed,

with especial reference to the situation in military medical practice. Frequently diagnostic efforts stop short of a clear understanding of the nature of the headache, with only a differentiation into three main categories—organic, psychogenic, and malingered—with no further differentiation except in the first type.

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DIAGNOSIS OF BARBITURISM

The most extensive experimental knowledge about barbituric intoxication is gathered in psychiatric hospitals where patients have been systematically subjected to prolonged barbital sleep in the so-called hibernation cure. In private practice, supervision of symptoms is more difficult because patients who are addicted to barbiturates do not go to their physician to be cured but only to get a new prescription when the drug store refuses further requests. Only when there is a complicating symptom do they ask for treatment, often without mentioning their habit. * * *

The diagnosis of barbiturism is simple when the patient gives an adequate history. However, he often denies habitual use of sedatives and refuses clinical investigation. In the hospital special chemical methods are available to show barbiturates in blood and other body fluids. When the patient is in coma this is the only dependable method of diagnosis. Twenty-five percent of all acute poisonings are barbiturate poisoning.

—JOOST A. M. MEERLOO, M. D.
in *American Practitioner and Digest of Treatment,*
p. 393, May 1954

SELF-INFLICTED GUNSHOT WOUNDS TO AVOID COMBAT

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FRANK J. HAMMER, *Captain, MSC, USA*
HELEN L. MARRS, *First Lieutenant, WAC*

THROUGHOUT the history of military medicine the problem of nonsuicidal, self-inflicted wounds has continued to concern those with the mission of maintaining the fighting strength of a combat command.[1,2] During the Korean conflict we were again faced with this problem. The situation at this hospital appeared to offer an opportunity to study this problem with the view of determining, if possible, the type of personality and the circumstances that lead to such self-mutilation.

In our opinion, all the self-inflicted wounds reported here were caused in an effort to avoid combat duty, and were without suicidal intent.

CLINICAL MATERIAL

The population studied included an experimental group of 75 patients and a control group of 25 patients. The control group had been treated for minor, enemy-inflicted gunshot wounds of the extremities. Because most of the men in both groups were wounded in the foot or hand, the types of injury and the medical treatment received were comparable. The age range of the test group was from 17 to 38 years with an average age of 21.6 years, while the age of members of the control group ranged from 18 to 28 years with an average age of 20.7 years. Most of the men had the rank of private or private first class; few, however, were corporals or men with higher enlisted ranks. There were no officers in either group.

PROCEDURE

The psychiatric team approach was used in the study of the patients, with the psychiatrist, the clinical psychologist, and the psychiatric social worker participating. The psychiatric evaluation included determining the patient's mental status, his feelings about the self-inflicted wound immediately before and

From Osaka Army Hospital, Osaka, Japan. Col. Smith is now assigned to Valley Forge Army Hospital, Phoenixville, Pa.

immediately after the injury, and his present feelings. An attempt was also made to determine whether or not his motivation for further duty was good, indifferent, or poor.

The psychologic examination was made to determine the intellectual levels and personality patterns of the patients. The Wechsler-Bellevue intelligence scale and the Rorschach test were administered to both groups. The psychiatric social history included detailed information of the soldier's service history and status, preservice background, past medical history, and the circumstances existing at the time of the injury.

OBSERVATIONS

There was not sufficient difference between the psychiatric social history of the self-inflicted wound group and the control group to justify a prediction as to what type of person is more subject to self-mutilation. The racial factor did not appear to be of importance, although definite conclusions were not possible because the exact proportion of Negro to white troops in the respective combat units was not known. The greater number of patients with self-inflicted wounds (73 percent) were in noncombat areas at the time of injury. Twenty-two self-inflicted wounds were considered to be in line of duty, a factor which was undetermined in the remainder of the cases. The self-inflicted wound group appeared to be composed of men who had spent a comparatively long time in Korean combat, but a relatively short time in total service; 50 of them had over 31 days of combat and 38 had over 61 days of combat, whereas 53 had less than three years of service. The majority of patients in both groups had less than six months' overseas service on their current tour of duty. Previous combat service in World War II did not seem to be a factor of importance in either group.

In the self-inflicted wound group 62 percent of the injury sites were on the left side, predominantly in the left foot and left hand. The explanations of the right-handed patients who injured themselves on the right side of the body appeared more plausible, and in the majority of instances their injuries were more severe. It appeared that the possibility of the wounding being truly accidental was greater when right-handed persons wounded themselves on the right side of their body than when they injured the left side. Sixteen patients (21 percent) had thoughts referable to their homes and families shortly before their accident; 35 (46 percent) shot themselves in the presence of others.

The men of both groups had an average level of intelligence, but the full scale intelligence quotient of the enemy-inflicted wound group was significantly higher than that of the self-inflicted wound group. The Wechsler-Bellevue pattern suggested tend-

encies toward instability in the self-inflicted wound group. The Rorschach test showed many similarities between the two groups, possibly because all the men were feeling elated about leaving Korea. Patients with self-inflicted wounds, however, appeared to have a constitutional psychoneurotic personality of the hysterical type. Traits of emotional lability also were more pronounced in this group than in the control group.

Our findings bear a relation to the work of other investigators on "accident proneness"[3,4] and suggest that unconscious dynamic urges, such as occur in hysterical amnesia, motivated these men. These urges were probably related to the "accidental act" which resulted in the self-inflicted wound.

Primarily, the psychiatric evaluation revealed that, in spite of the extensive information obtained in this study, it was not possible to predict what type of person is apt to shoot himself. None of the 75 patients in the test group, when first seen, appeared to have a psychiatric condition which required either hospital or outpatient treatment. Eight of the 75 were sufficiently unstable to justify recommendation of a three-month waiver for combat duty. Of these, seven had character and personality disorders, and the other had anxiety which justified reprofiling. Two of the 25 in the control group showed psychiatric findings sufficient for the recommendation of a three-month waiver for combat, but they did not need psychiatric treatment.

The lack of clinically observable anxiety in the test group may suggest a psychoneurotic constitutional make-up of the hysterical type as indicated in the psychologic findings; this, however, is conjectural, because the findings in the control group were not remarkably different. On evacuation from the combat front, the lack of anxiety is common to most wounded patients. The control group was not studied concurrently with the self-inflicted wound group, and was not necessarily made up of men from the same units. These are two important factors that may have influenced our findings. Guilt feelings were elicited in about 50 percent of the patients with self-inflicted wounds, but not in the controls. Members of the self-inflicted wound group, unlike those of the control group, showed some consciously expressed motivation for return to duty, preferably with their former units; however, the nature of the injury made it obvious both to patient and physician that further immediate full combat duty was out of the question.

CONCLUSIONS AND RECOMMENDATIONS

Factors other than those evaluated in this study apparently must be included in any future investigation of this type before tangible, helpful conclusions can be made regarding the type

of person or the set of circumstances leading to self-mutilation. The psychodynamic significance of self-inflicted wounds in the combat setting should be further studied. Such a study could better be made at the combat level where such factors as motivation, group identification, leadership, and morale can be evaluated more adequately. Controls from identical units at the combat level should be studied concurrently. Whether or not a self-inflicted wound, claimed to be accidental, occurred in the line of duty should be determined immediately, and by appropriately assigned personnel in the concerned patient's own organization.

SUMMARY

In a study of an experimental group of 75 patients with self-inflicted gunshot wounds, and a control group of 25 patients with enemy-inflicted gunshot wounds, it was not possible to predict the type of person or the set of circumstances that lead to such self-mutilation. Certain pertinent associations relative to self-inflicted gunshot wounds were noted: (1) 73 percent occurred in noncombat areas; (2) 62 percent of the injury sites were on the left side of the body; however, those right-handed persons who injured themselves on the right side of the body appeared to have more serious injuries and gave a more plausible explanation to substantiate their claim of an accident; (3) combat service in World War II did not seem to be a significant factor; (4) none of the patients were psychotic or in need of psychiatric treatment when seen; and (5) guilt feelings were elicited in about 50 percent of the patients with self-inflicted wounds, but in none of the controls.

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THE REJECTED MANUSCRIPT

No manuscript is ever rejected without good cause, and a rejected paper, if published, would seldom enhance the author's reputation. The immediate reaction to a rejection is naturally a feeling of surprise, disappointment, or concern, but this will soon pass off when it is remembered that a critical editor is the best guardian of an author's good name.

— RAYMOND WHITEHEAD, M. D.
in *Lancet*, p. 477, Sept. 5, 1953

LEONARD WOOD, A GALLANT MAN

CHARLES H. BRADFORD, *M. D.*

IN 1884, Leonard Wood was launched on a career of greatness by being fired. He was an intern at the Boston City Hospital at the time. Regulations forbade house doctors from performing even minor operations without formal permission, but Wood disregarded the formality in a case of a simple skin graft. The superintendent ordered his dismissal, and although the visiting surgeons submitted a written protest, with high commendation of Wood, his punishment was approved by the trustees. From his office, the superintendent watched Wood walk out of the institution, and remarked, "There goes a young man who will never come to any good."[1] The incident was typical of Wood's whole career. The only authority he ever thought he really needed was to be right.

Wood entered practice, succeeded in a small way, yearned for adventure in a large way, entered the Army as a contract surgeon and, on request for active service, was sent to Arizona, where the most strenuous and the last of the great Indian campaigns was about to begin. For years the Apaches, under Geronimo, had defied the United States Army, pillaged the countryside and murdered and tortured their victims. Over 800 ranchers had been killed. Wood joined Captain Lawton, of the Fourth Cavalry, and set out to track down the Indians across their native mountains and deserts until sheer exhaustion forced them to capitulate. In the 20-month campaign that followed, he became known as "one of the few men who could ride, run, or walk down an Apache."[2] When line officers gave out, Wood substituted for them. Geronimo finally surrendered in 1887. Wood was awarded the Congressional Medal of Honor.

After the campaign, he became one of the very successful practitioners in the city of Washington, if success may be measured by the character of a doctor's clientele. Besides cabinet officers and prominent officials, two Presidents of the United States adopted him as their family doctor—Cleveland and McKinley. Wood made the acquaintance of a new, young friend: Theodore

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From Boston University School of Medicine.

Reprinted with permission from *The New England Journal of Medicine*, vol. 247, pp. 526-528, Oct. 2, 1952. Photographs from the collection of the Armed Forces Medical Library, not included in the original manuscript, have been added.

Roosevelt. Together they forsaw the impending war with Spain, and they planned to be in it. Their opportunity came when Congress authorized a new regiment, the First Volunteer Cavalry, soon known as the Rough Riders. Wood was assigned to the colonelcy. His old frontier comrades, ranchers and cowboys, flocked to serve under him. Roosevelt, as lieutenant colonel and second-in-command, attracted adventure-seeking college boys from the East; in later years, O. Henry described the regiment as composed of "the aristocracy of the wild men of the west; and the wild men of the aristocracy of the east."

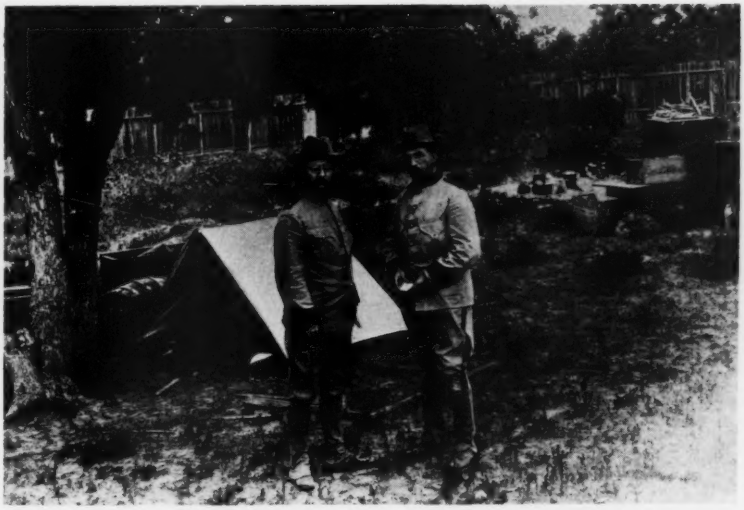
This photograph was made in 1886 when Wood, a contract surgeon and Indian fighter with the Fourth Cavalry Regiment at Fort Huachuca, Ariz., was 28. The following year when Geronimo, the Apache chieftain, surrendered, he was awarded the Congressional Medal of Honor.

Wood achieved an unbelievable record for speed in organizing this regiment. He recruited the men, equipped them, drilled them, transported them to Cuba and led them with brilliant success in combat at Las Guasimas—all in the space of 47 days.

Military victory was one of the least significant aspects of the Cuban campaign. The real glory grew from administrative triumphs. This was Wood's greatest achievement. After hostilities ceased, President McKinley appointed him governor general of the island. The job looked impossible. Wood set about to clean the cities. He paved the roads and rebuilt and extended the railroads. He developed a national system of public education. He

instituted local self-government, established a native constabulary, organized law courts and arranged a constitutional convention. He resurrected and refinanced the economy and reduced the ravages of disease to a reasonable minimum. All this was done so effectively that within four years, a new Cuba had been created, and was given back to its native population as an independent country. The young man who would never come to any good was not yet 43.

As governor, Wood played a leading part in the work of the Yellow Fever Commission. He had urged the appointment of a board of experts to study the disease, and when Walter Reed



Promoted from a captain in the Medical Department to colonel of the First U. S. Volunteer Regiment on 8 May 1898, Wood recruited the famous "Rough Riders" of the Spanish-American War in San Antonio where he was photographed with his deputy, Lt. Col. Theodore Roosevelt, left, who had resigned as Assistant Secretary of the Navy to serve under him. When Wood was advanced to brigadier general in July of the same year, Roosevelt was promoted to colonel and given command of the regiment.

and his heroic group were sent to Cuba in response to this appeal, Wood obtained the funds to prosecute their researches. When they reached the point where human experimentation became essential for a final proof, it seemed certain that officials in Washington would withhold permission, but Wood never asked for it. With scrupulous care, he laid down the conditions for volunteering, and then authorized the experiments on his own responsibility. Dr. Rixey, a well known Army surgeon, wrote: "When history has forgotten General Wood the soldier, and Gov-

ernor Wood, the administrator, it will still remember Dr. Wood, the surgeon who conquered yellow fever."[2]

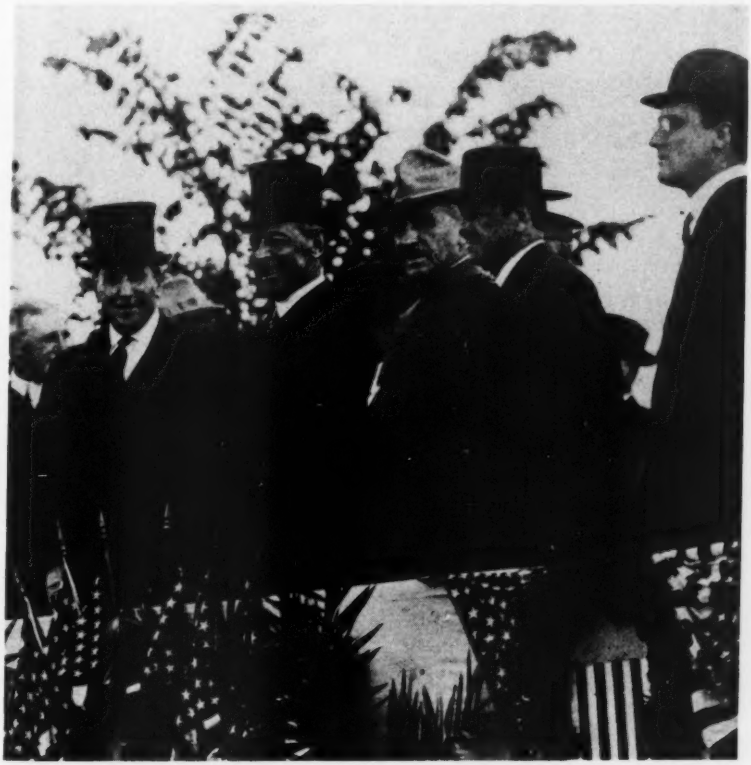
In 1902, by invitation of the Kaiser, Wood attended maneuvers of the German Army, and there he formed the conviction that a world war was inevitable. He started, even then, to preach preparedness but could do little about it. Instead, he campaigned vigorously in the Philippines, and established peace among a fiercely hostile population. In 1910 President Taft made him chief of staff. Still aiming at preparedness, Wood attempted to renovate the entire military establishment. He closed obsolescent Indian forts and brought the Army east for battle maneuvers; he revitalized officers' promotions, started courses for training civilians and reviewed the *Manual of Courts Martial*. He introduced new weapons, such as the hand grenade and the shot gun, and later the standard carbine, and the Lewis machine gun; he revived bayonet drill, which had been neglected. Only six years after the flight at Kitty Hawk, he insisted on an aircraft department for the Army. "Sooner or later," he said, "the aeroplane will be the greatest factor of the century in world affairs."[3] Slowly, he had molded the framework of an up-to-date army.

No man can make a life-long policy of progress and reform without arousing bitter opposition. Wood had become explosively controversial as Governor of Cuba, and so he remained. The formidable soundness of his conduct repelled critical onslaughts; behind this, he received staunch support from three presidents. As the war that Wood had predicted drew near, Wilson's pacifist administration assumed power, and Wood's influence ended. He was transferred to a subordinate departmental command, but even here, he urged "preparedness" until it became a byword. At Plattsburg, he inaugurated extremely successful officers' training camps, but he was officially reprimanded for his zeal. He submitted a basic selective-service plan, which the administration grudgingly accepted—but it refused to accept Wood. Deprived of the top command, he was offered a humiliating choice of training assignments. In the face of spiteful jealousy, he showed some of his finest traits of character. "I am a soldier," he said, "and go where I am sent." His superlative work in training the 84th Division in Kansas was rewarded by his being relieved of command when the troops embarked to win battle honors overseas. "Leonard Would, but they won't let him," the papers commented.

In 1920 the public wanted Wood for the presidency—at least, he won and held a large lead at the Republican convention over his nearest rival, Governor Lowden. However, a coalition of political enemies succeeded in blocking him, and Harding was nominated. Wood returned to the Philippines as governor, and he

again displayed his administrative genius by eight years of far-sighted and constructive leadership.

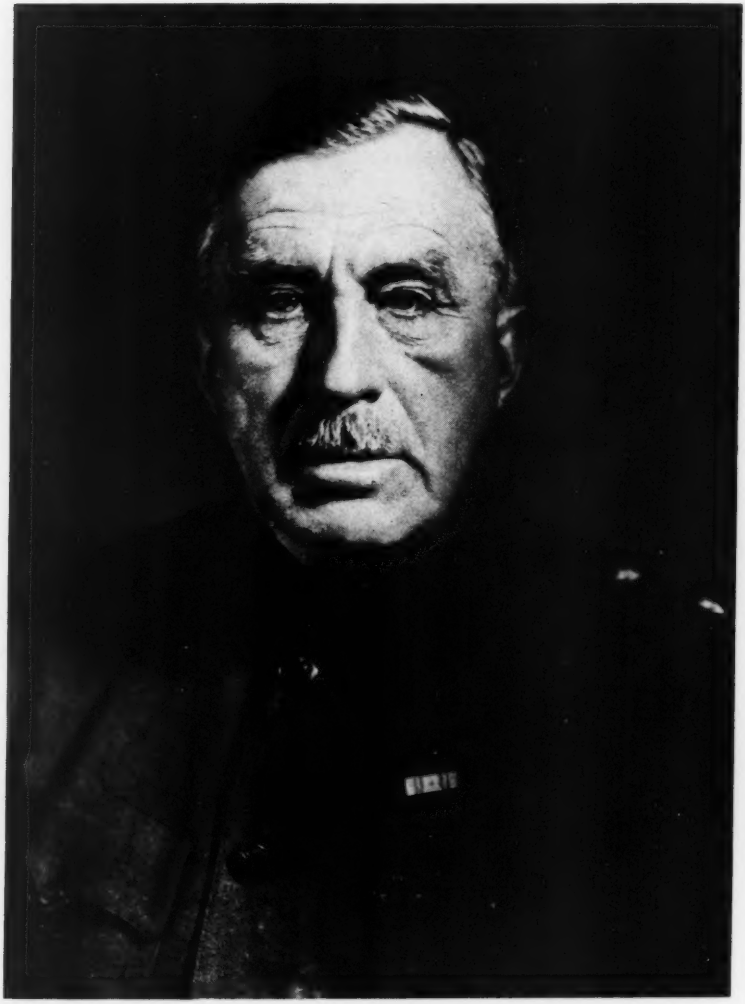
Throughout this amazingly active career, Wood carried a physical handicap that would have incapacitated most men. In 1902 his head struck a chandelier, and a meningioma slowly developed.



At a military review of 2,000 U. S. Army cavalry troops in Washington, D. C., on 13 October 1913, General Wood, then Chief of Staff of the Army, stood between President Wilson and Secretary of the Navy Josephus Daniels. At the left is Secretary of War Lindley M. Garrison. The young man at the extreme right is Franklin D. Roosevelt, 31, who was sworn in as Assistant Secretary of the Navy on 17 March of that year.

By 1908 this caused spastic paralysis of his left foot and occasional convulsive seizures. Both Weir Mitchell and Osler missed the diagnosis. An inadequate operation was performed by a Boston surgeon in a house at 2 Louisburg Square. Two years later, Cushing successfully resected the tumor. Complete relief

resulted for a number of years, but gradually the tumor recurred. Wood refused to yield time for further treatment until he was almost completely disabled in 1927. Cushing canceled a vacation



Leonard Wood was the only medical officer in history to become Chief of Staff of the United States Army. He retired in 1921 to accept an appointment as Governor General of the Philippine Islands. The great portrait painter, John Sargent, believed that Wood's face was one of the finest Anglo-Saxon types and this photograph reveals many of the qualities which induced him to ask Wood to sit for him. At the time, Sargent's services were being sought by people of position and wealth in all parts of the world.

in Europe to operate again. This time the tumor had reached the size of a lemon, and though it was successfully removed by an operation lasting eight hours, postoperative hemorrhage developed in the ventricles. "So ended the life of a gallant man...," Cushing[4] regretfully commented, believing that a two-stage operation might have succeeded.

The best summary of Wood's career is provided by his own comments when a staff officer, Major Eric Wood,[2] asked him the rules of his life. He replied:

> Always volunteer, no matter how dangerous or unpromising the task. Once you have volunteered, never stop fighting. Do things, and don't talk about them. During the process you are likely to discover opportunity; eventually you can win through to a success...; and then you will have the pleasure of hearing un-enterprising men, who would never take a chance, allude to your achievements as due solely to luck and influence.

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MEDICAL WRITING FOR PUBLICATION

If we are going to write for publication in medical journals, we must face the fact that writing is hard work and full of frustations. Probably the hardest job of all is to get started. For example, I have been thinking of working up a paper on the general management of several hundred maternity cases in a small-town clinic—discussing the various ways of handling anesthesia, prolonged labor, induction of labor, reasons for referral to hospitals for surgery, dangers of breech deliveries, and other factors. I am discouraged at the amount of work required to do this, and I am worried by the prospect of disappointment if my efforts are rejected. But I am going to start writing that paper right now. If I keep on thinking about the work and worrying about the possibility of disappointment, I'll never get started. I believe that I have something good to write about. I am going to try to write well enough that my article will be accepted. If I fail, then I'll try again.

—EDWIN T. ARNOLD, Jr., M. D.
in *GP*,
p. 33, Apr. 1954

SELECTION OF MARINE CORPS PLATOON LEADERS

WALTER L. WILKINS, *Ph. D.*

AN operational definition of hazardous duty in the armed services might be obtained by simple reference to the types of duty for which extra pay or other incentive is allowed, such as those defined in Army Regulations 35-1200 (flying), 1210 (diving), 1240 (glider), 1250 (parachute), 1260 (underwater demolition), or 1270 (combat duty pay defined geographically), or in the pertinent naval regulations referring to comparable duties.

Hazardous duty might be defined also by examination of the physiologic stress in certain duties, as illustrated in the study by Davis and associates,[1] or by examination of the psychiatric effects of hazard, as illustrated in the studies of survivors of ship sinkings[2] or aircraft downings. Still another definition would consider the stresses presented by the climatic environment, which create problems in personnel selection for arctic or tropical duty.[3,4] Another operational approach would relate casualty rates of various types of military duty, using the rates as measures of the probability of disablement in the different situations.

It remains a question, however, whether any definition of hazardous duty is psychologically meaningful at present. At least we do not have, as yet, independent identification of psychologic characteristics which are involved in all situations defined as hazardous.[5]

For especially arduous or hazardous duty, factors in determining personnel requirements such as physical characteristics, intelligence, special aptitudes or abilities, and special background or personality factors have been considered separately. The physical characteristics are well illustrated by the general stamina and specific swimming capabilities required for underwater demolition team members, or by the physical ability to stand deprivations or stresses within certain limits, as in air or

From Department of Psychology, St. Louis University, St. Louis, Mo. The data referred to in this report was collected with the co-operation of the staffs of Neuropsychiatry Section, Professional Division, Bureau of Medicine and Surgery, Department of the Navy and of Headquarters, U. S. Marine Corps.

Presented at the annual meeting of the American Psychological Association, Cleveland, Ohio, 9 Sept. 1953.

submarine crew members. The factors of intelligence relevant to combat efficiency are not yet spelled out. It may well be that fear is unrelated to any of the measured aspects of intelligence; yet efficiency in stressful situations should certainly be related to mobilizable intelligent response. Personality factors crucial to success in some sorts of military operations are instanced in the studies of the various keys for scoring the Air Forces Biographical Inventory. The unique skills significant in leadership of hazardous operations have been commented on by Haggard[6] and Edgerton and associates.[3]

But all of these characteristics, some more and some less presently amenable to reliable measurement, depend upon the special operational requirements of the task involved. It seems clear that there are certain characteristics which would be desirable in any sort of hazardous duty, or indeed, in any sort of service life. The military services seem to want men who are sturdy, who learn quickly and permanently, and who are cheerful and ingroup minded. Analysis, however, of the special requirements for underwater living and fighting, of polar or desert operation, or of mine warfare should reveal minimal physical, intellectual, social, and even character standards which are necessary. It is obvious that such special and detailed analysis has been most advanced and fruitful, and has been carried out with the greatest awareness of the necessity for validation procedures in the air and submarine services. Recent research, however, has focused attention on the very real problems involved in ground forces actions.[1]

Of the armed services, the Marine Corps has been most effective in maintaining the point of view that every member of the organization no matter what the assignment, should have a minimal number of basic fighting skills which he can perform in an efficient manner. Whether the duty involves garrisoning a small island for long, deadly periods of time, or being committed to severe and conclusive action of a shorter but even more deadly sort, every marine, on the basis of his initial training, is presumed to be able to fight, to handle his weapons effectively, and to have the necessary spirit and morale. This by no means implies that every marine will see desperate combat; it only implies that he should be able to handle himself adequately in such combat.

This article considers some features of a research program with the purpose of identifying some characteristics possibly typifying Marine Corps platoon leaders, especially those chosen from enlisted ranks for commissioning and selected for their probable aptitude for effective leadership of infantry units in combat. I shall point out some blind alleys which looked good

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at one time, but shall also try to emphasize what few relationships I believe we can rely on.

Marine Corps second lieutenants receive their commissions from various sources, such as the U. S. Naval Academy, the Naval Reserve Officers Training Course, platoon leaders classes, and officer candidate school classes, which are composed of college students and college graduates who are not members of ROTC. But the Corps has selected for commissioning upon a meritorious basis many enlisted men. In 1949 a systematic program was set up by the Marine Corps to identify and commission the best qualified enlisted men. Provisional validation of aspects of the selection process has been reported to this division and to military men responsible for personnel decisions.

For consideration at the Officer Candidate Screening Course, Marine Corps Schools, Quantico, Va., the enlisted man has to possess a minimal General Classification Test score (120 without college, 115 and 110 with 2-year college equivalency), and be recommended by his commanding officer. This recommendation is usually based on the judgment of a board of local officers who considered the man's officer potentialities, especially his chances of surviving the screening course. Within the Corps, the three week screening process is currently regarded in many ways the most rigorous road to a commission. Selection of those for commissioning also has been rigorous, percentagewise as well as physically, with the percentages of men commissioned, even from a select group, ranging from 45 to 72. The screening process at Quantico is designed to allow candidates the widest possible opportunity to demonstrate leadership potential, and includes tests and field exercises aimed at assessing physical stamina, level of intelligence, ingenuity, forcefulness, command presence, leadership of structured and of leaderless groups, ability to communicate ideas, and awareness of current general and strategic problems. Recommendation for commissioning comes from the commanding officer only and is guided by a consensus of the experienced Marine Corps officers, all men of considerable combat experience, who are detailed as assessors. Criteria for the assessors' recommendation of a man has some flexibility at times. At the time of greatest need for combat platoon leaders it could be expressed by the question: "Would the average platoon in a fire fight in Korea be better off with this man as a second lieutenant than it would be with the sergeant presently in charge?" At the most rigorous selection time, the question probably was something like, "Is this man distinctly superior to the present second lieutenants in the Corps?" or "Is this a man I, as a company commander, would have unwavering confidence in if he were one of my platoon leaders?" or even, "Would this man make a good major or colonel in the Corps?"

The efficiency of the selection procedures from the ranks has been tested empirically by operational decisions at various points. The first is the obvious one where some men are commissioned and some are not. The only crucial factor in the decisions as to who shall be commissioned has been the vote of the Marine Corps assessors. The purpose of each aspect of every subcourse of the screening procedure is to provide these experienced judges with as wide an opportunity to observe the candidates in stressful situations as possible. The stress from situation to situation is deliberately varied, so that the man who excels his peers in a situation where resistance to physical stress is important may not appear so outstanding in one where a decision from a leaderless group is required. I might say that some of the psychological tests which have shown disappointingly low discriminations have been kept in the program beyond their expected life span because they seemed, in the candidates' opinions, to be somewhat mysterious and "hard to fake," and because some of the men identified among candidates as "hard-chargers" were stumped by them. The effect of this emphasis on stress and on not knowing what comes next is to keep nearly all candidates in doubt of their status throughout the course.

After commissioning, the Marine Corps sends new second lieutenants, regardless of previous experience, to Basic School, Marine Corps Schools, Quantico, where for several months, the length of the course depending on the state of the national emergency, they study the problems of the officer of company grade, with emphasis on the combat function of the Marine Corps. At the end of this course each officer receives a grade in academic work and in leadership, and a final combined grade which ranks him. Officers selected from the screening course are found in substantial numbers in the top deciles, quintiles, and halves of these classes, and are found infrequently in the lower sections. Judged by their ability to compete with graduates of Naval ROTC programs, the U. S. Naval Academy, and civilian college programs, these men are more than adequate.

The particular group reported on for combat proficiency consists of 66 second lieutenants in the U. S. Marine Corps, serving with the First Marine Division in Korea, while the Division was in a combat status. These represent 90 percent of the officers who might possibly be reported on; that is, former enlisted men commissioned through officer candidate screening courses and serving in Korea at the time of the follow-up. All of these officers were involved in some aspect of combat operations. Thirty-seven were with rifle and other combat platoons, 19 were with artillery and with operations, and 10 were with other services.

As the rating scale approach used in combat situations has some demonstrably satisfactory uses[7,8,9] as well as the ad-

vantages of economy and celerity, a rating scale was used. To assure independence of raters' judgment, as possibly or popularly differentiable from regular fitness report data, ratings were returned directly to me and not through military channels. It was hoped that biases popularly supposed to be typical of fitness reports might be avoided. In point of fact, fitness reports of second lieutenants are generally so normally distributed that it appears there is no bias in reports for that lowest level of commissioned rank. The scale itself included 14 items, in order to allow some comparison of presently studied groups with World War II research on Marine Corps officers. The other items were directed toward obtaining some estimate of efficiency under combat stress, emotional maturity, drive, expression of feelings, flexibility, and respect of peers.

The 66 returned rating scales were dichotomized to separate the men rated outstanding from those with ratings approximating mediocrity in the characteristics listed. The results of this dichotomy were compared with results of psychiatric rating based on interview; the psychologist's subjective estimate of officer potential estimated from over-all Rorschach protocol; a medico-psychologic rank order arrived at by a short conference between the interviewing psychiatrist and the psychologist who made the Rorschach inquiry and evaluated the paper and pencil tests; peer ratings of fellow officer candidates before commissioning; final assessment at the end of the officer candidate screening course, made by the experienced Marine Corps officers; leadership grade earned at the end of basic school for second lieutenants; and final grade at the end of basic school, including academic achievement.

Noteworthy is the corroboration of the results reported by Williams and associates[9] for the peer ratings. Although their measure of peer evaluation was different from the one we used,[10,11] we now have further evidence that for certain situations a man's peers are the best estimators of his potential worth, provided his peers are experienced marines. Thus the best predictor of how a platoon leader in combat will be judged for over-all effectiveness by his immediate superior is the estimate of his fellow candidates before he is commissioned. Almost as good is the combined judgment of the Marine Corps officers who observed him competing with those peers while he was a candidate. Measures which predict over-all combat proficiency with less success are the psychiatrists' rating after a 15-minute interview, the candidate's academic achievement while studying the duties of a company grade officer, and the ratings of leadership made while the man is in the first few months of his commissioned service, at school.

Peer proportional rank is also the best predictor of a characteristic defined as potentiality as a combat officer, and ranks with screening course standing in predicting day-to-day consistency in moods and temper. Of course peer ranks and screening course standing are highly related.

A number of paper-and-pencil tests, initially selected for face validity because they purported to measure characteristics defined by assessors as critical, have not as yet been compared with combat ratings. On proximate criteria they proved less efficient than might have been expected. Promising empirical keys for interests as on the Kuder, values as on the Allport-Vernon, and emotional factors as on the Rorschach test, lost much, and sometimes all, of their discriminatory capacity on cross-validational samples. This does not suggest that we believe that these personality areas are of little importance, but does suggest that the subtlety and inventiveness of our measurement of them are inadequate.

The usefulness of the officer candidate screening course is further suggested by some of the results of the Korean ratings. For instance, the correlation between final assessment before commissioning and the over-all dichotomy is respectable and with good fiducial characteristics. The correlation between rating of over-all opinion of the man as an officer in combat in Korea and the final assessment at screening is .34, and between the Korean rating on the degree to which he is respected and followed by men under his command and the final assessment at screening is .31.

One of the combat ratings which is not predicted by the Marine Corps officers recommending commissioning or not is the item of technical proficiency in one's billet (bis $r = -.06$). This we believe is justifiable, for the screening course aims to select good men from any Marine Corps assignment, and is careful not to weight heavily previous infantry combat experience so that the enlisted man with such experience is rewarded over the man without it. We find peer ratings of little use in predicting this item; on this point our results are quite different from Leavitt's.[4]

Reaction to stress and fear as rated in the Korean situation proved quite difficult to predict. The psychiatrists' ratings of ability to withstand stress and of motivation were unrelated. Medicopsychologic rank order was positively correlated with rated ability to handle one's self ably in stressful or fear-provoking situations (.33), and peer ratings also had a positive relationship (.26). Inherent in the results here must be some of the conditions to which attention has been called by Lazarus and associates.[5] New leads in the assessment of men's reaction

to stress are offered in the results of the recent Korean study by Davis and associates.

We have found that items that may successfully predict the status of an officer candidate at one stage of his selection or training career may not be so successful at career points later on, a point cogently made by Kelly and Fiske[12] in their study of trainees. For instance we reported[13] that certain items obtainable through a biographic inventory or personal history blank significantly differentiated between the best of the candidates selected for commissions and the lowest of those failing of selection. Among these were the education of the candidate's father; the extent of the candidate's active participation in football, basketball, and baseball; whether a man had been a team captain; his religious affiliation; and his self-estimates of strength, endurance, and courage. But when we look for differences in these crucial areas of personal background which might differentiate the outstanding combat platoon leader from the mediocre one, we find none.

Despite the relatively good results we show for peer ratings, I believe that some admonition should be given against possibly abdicating any present screening functions, especially judgmental ones, and turning them over to peer judgments. Logically, if peer judgments could predict any of the behaviors listed in the present table, respect of the men should be included. Yet one finds a correlation of .20, which lacks significance. It was also found that the judgment of Marine Corps screening assessors is significantly related. The peer ratings are a most promising tool, but maximally effective use of this tool awaits better analysis of the dynamics of its operation and refinement of the technics appropriate to each situation warranting its use.

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STATISTICS ON THE BABY BOOM

The number of births in our country has continued at record high levels since the end of World War II. Well over three and one-half million babies were born in each of the past seven years, the number reaching nearly 4 million in 1953, or more than one and one-half times the births in 1940. The sustained baby boom reflects a rise in fertility rates but to an even greater extent the increase in the married population.* * *

Couples in our country generally begin to raise a family at a relatively young age. Thus, in 1950, births occurred at a rate of 33 per 100 in families where the husband was under 25 years of age. That is, each year about one third of the married men at these ages become fathers. The proportion is about one fourth for the men in their late 20's and one sixth for those at ages 30-34. The fertility rate is particularly high among young married women; two fifths of the teen-age wives had a child in 1950.* * *

Family life in our country has benefited materially from the fact that most couples have their children at a relatively early age. For one thing, the hazards of maternity are at a minimum at this period of life. Then, too, with mortality currently at a low level, the prospects are good that the child will have the benefits of parental care during its years of dependency. Nevertheless, there is always the chance that the individual family may lose these advantages by the untimely death of the breadwinner. This is a contingency to be provided for in the family budget.

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Mar. 1954

CREW SELECTION FOR SUBMARINE DUTY

GERALD J. DUFFNER, *Commander (MC) USN*

SUBMARINE crews must be chosen with particular attention to demands that are peculiar to the service. This article reports group research on personnel selection, and deals with submarine environment, existing assessment processes, and research hypotheses related to criterion development and methodology.

Special demands imposed by the submarine environment[1] make selection necessary. Eighty men are encased in a cigar-shaped tube about the length of a football field, where all available space not occupied by propulsion, communication, and detection equipment must serve more than one purpose in providing facilities for recreation, eating, sleeping, and study. There are loss of privacy and situational factors predisposing to the formation of small isolated groups. In addition, there are other environmental factors,[2] especially during wartime patrol activity, that add to the hazardous or threatening aspects of the submarine situation. These factors may be grossly categorized as (1) psychological stress factors in undersea warfare,[3] and (2) physiologic impairment factors that enhance the noxious effects of the stress.

The first stress factor associated with undersea warfare is the instability of the submarine as a weapon. It is the only naval vessel which operates in three dimensions. Loss of depth control will result in eventual crushing of the hull; and simply being submerged makes such usual hazards of mariners as fire, collision, and grounding much more serious. Escaping from a disabled submarine at a depth of as much as 300 feet presents a serious risk. The second factor is the nature of submarine operations. During war patrols men must live on board submarines for as long as 60, or sometimes even 90, days. In addition, the submarine usually operates by itself, and the absence of contact with other friendly forces creates a feeling of loneliness. The third factor is the nature of antisubmarine tactics. Under attack, the submarine can do nothing but make limited efforts to evade its antagonist and cannot fight back. The crew must remain as silent as possible in a hot, humid, and tense atmosphere.

From U. S. Naval Submarine Base, New London, Conn.

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Besides these stress elements to which a submarine crew must adjust, there are environmental hazards which impair the physiologic function of the men. We have reason to believe that the cumulative result of fluctuation of pressure, increase of carbon dioxide tension, and reduction of oxygen tension may have some effects on performance.

The task of the medical research laboratory at this naval base has been to select men who are able to adjust optimally to this kind of environment. The problem has been made much less complicated by the fact that the Navy has been able to continue the policy of making the submarine service entirely a volunteer one.

EXISTING ASSESSMENT PROCESSES

At this point it might be well to consider the life cycle of the submariner.[4] Volunteers for submarine duty are obtained both from the fleet and from recruit training centers. They are then assessed at this base, and those who have physical defects or personality disorders which render them a poor risk for submarine duty are rejected. The remainder go on to basic submarine school. Those completing the school are sent to a submarine where, after about six months, they must have completed a notebook containing drawings of all the piping and ducts on the submarine, and must pass a practical examination. If they are successful in this, they become "qualified," with the right to wear the dolphins on their uniforms; otherwise they are disqualified. Even a qualified man whose performance later falls below what his commanding officer considers to be the standards of the submarine service, can then be disqualified.

The assessment procedure consists of psychologic tests, to be described later; a physical examination for any evidence of active or chronic disease; special sensory testing, which includes pure tone audiometry; and a sonar aptitude battery. All of these are administered by the group method. Near normal color perception is required, but visual requirements are adjusted according to the man's rating or job. The candidate is next subjected to a 50-pound pressure test in a recompression chamber to test his ability to equalize pressure. He is then given submarine escape training. These two procedures provide a stress-provoking situation for candidates with excessive amounts of anxiety or those with specific fears such as claustrophobia. Finally, an interview is conducted by a submarine medical officer, where the assessment is concluded by integrating the results of the foregoing examinations and tests. From the outset of the program at this base, a great deal of the research effort has been directed toward criteria development, the assumption being that until we are able to discover reliable operational

criteria defining a successful submariner, it will be impossible to ascertain the validity of prediction variables.

METHODS OF CRITERION RESEARCH

The criterion research may be broken down into four overlapping areas arbitrarily defined as (1) pools of traits, defining the good and the poor submariner; (2) performance and achievement criteria; (3) investigation of the "qualify-disqualify" criterion from the standpoint of discovering the contingent criteria associated with the dichotomous criterion groups; and (4) sociometric criteria. The areas of research emphasis are indicated in figure 1.

In the first area of investigation, that is, description of submariners at the trait level, experienced submariners were asked to describe a "good" and "poor" submariner, and to give an incident exemplifying the "good" and "poor" traits they observed in these men. By this method a trait population, consisting of 78 traits and behavioral phrases describing both "good" and "poor" submariners, was sorted by 14 officers, and a Q-type cluster analysis[5] was performed. A cluster was found to be composed of the following positive criterion traits: dependability, emotional stability and maturity, alertness and intelligence, and no signs of nervousness. The negative criterion traits were found to be dreaminess, "lone wolf" characteristics, recklessness, shyness and submissiveness, and self-pity.

In the second area, that of performance and achievement, several criteria have been investigated. Such items as grades, class rank, and ratings in the submarine school and various service schools have been investigated as intermediate criteria. Other performance criteria are being investigated by Wilson[6] in submarines at San Diego, in an effort to develop a criterion of shipboard performance.

Previous studies[4] involving practical performance tests, performance checklists, and rating scales have indicated that rating methods would provide a reasonably reliable estimate of performance in two broad areas—personal adjustment and technical competence. The rating scale approach seems to fit our current research needs best, although the use of rating scales as criteria of performance aboard submarines poses several problems. These arise because: (1) the 70 or more men who make up each submarine crew represent 10 or more technical specialties and several pay grades, (2) aboard submarines there is a great deal of flexibility in job assignments, and (3) there is a great difference between submarines. Ideally, for the purpose of comparing men from submarine to submarine, the rating scale should yield an absolute score in each of the areas of technical competence and

SELECTION OF PERSONNEL FOR SUBMARINE DUTY
CRITERION RESEARCH
PREDICTOR RESEARCH
AREA (1) POOLED CRITERION TRAITS
AREA (2) PERFORMANCE and ACHIEVEMENT CRITERIA
AREA (3) QUALIFY - DISQUALIFY CRITERION
AREA (4) SOCIOMETRIC CRITERIA
SOME DESCRIPTIVE TRAITS TENTATIVELY ACCEPTABLE
METHODOLOGY
CRITICAL INCIDENTS
POSITIVE CRITERION TRAITS
1- Dependable, Stable, Emotionally Mature, Leadership Ability, No Signs Of Nervousness
NEGATIVE CRITERION TRAITS
2- Reckless, Shy and Withdrawn, Show Off, Self Pitying, Lone Wolf
Q-Sorts With Total Population As Normal
Matrix Analysis and Comparison of Empirical Ratings Scales For Traits Defining Each Factor.
Empirical Determination of Inter-Rater and Repeated Reliability
Adjustment Criterion
A- Submarine School and Service Ratings (Grades, Rank, Ratings, Etc.)
B- X-O's Ratings As To Adequacy Of Naval Adjustment To Submarine Life
C- Other Performance Criteria
D- Shipboard Criterion Measures
1. Personal Adjustment To Navy Life
2. Technical Competence
SUBSEQUENT CRITERIA ASSOCIATED WITH QUALIFY-DISQUALIFY CRITERIA
A- At Time Of Qualification
B- Time To Qualify
C- Obtain From Psychiatric Interview At Time Of Disqualification
A- Peer Ratings
B- Holmlund Analysis
VOLUNTEERING FOR SUBMARINE SERVICE
SELECTION FOR VOLUNTEERING PHYSICAL QUALIFICATION EXAMINATION
AREA-3-TRAINING TANK OBSERVATIONS
AREA-4A-BASIC BATTERY
AREA-3T
AREA-2A
AREA-3A
AREA-2C
GCT
MTH
SPR
Mechanical MATH
PERSONAL HISTORY
GROUP TAT
(1)
PRESENT PREDICTOR COMBINATION
SEMI-STRUCTURED INTERVIEWS BY SELECTION OFFICERS OF CANDIDATES ASSESSED ON BACKGROUND FACTORS, JOB HISTORY ETC. (Interviewers Rated Items) on
1. Personal Adjustment
2. Adjustment to Navy Life
3. Drive
4. Intelligence
5. Drive
6. Interest in Submarines
7. Aptitude For Submarines
PREDICTED SUB SCHOOL QUARTILE
AREA-2A
AREA-4A
SEMI-STRUCTURED TAT MODIFIED PICTURE COMPLETION
Form M-F
Opinion Questionnaires
LOCKE MARITAL ADJUSTMENT QUESTIONNAIRE
ROLE TEST
(2)
OTHER PREDICTOR VARIABLES USED EXPERIMENTALLY
Basic Battery
Modified Q-Sort
Holmlund Analysis
Interpersonal Assessment
Rapidity (Card Sorting)
Symbol Substitution
AREA-1B
AREA-4B
AREA-1
TAT (Group)
Sentence Completion
(Some 30 Variables In All)
(3)
PREDICTOR VARIABLES USED ON OPERATION PREDICT
LEGEND - Symbols on Predictor Variables Designate the Criterion Area and Sub-Area in which Prediction Validity has been Investigated

Figure 1.

personal adjustment. Our past experience had indicated, however, that (1) even statements about specific observable behavior did not lead to satisfactory valid ratings of that behavior; (2) raters will agree in general on the rank ordering of a group of men, but

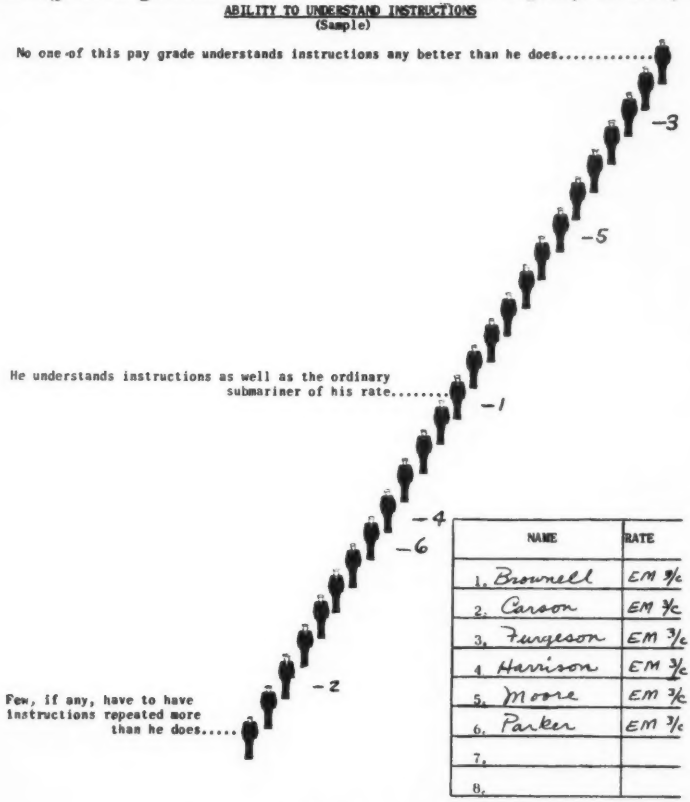

Figure 2.

the absolute scores they assign may differ greatly; (3) in an effort to make ratings comparable from submarine to submarine and from rater to rater, a common reference statement, such as "the typical third class electrician's mate I have known" or "the best engineman striker I have known," may prove helpful; (4) rated ability is so closely related to pay grade that any study of the validity of predictors using ratings as a criterion must be performed on a within-pay-grade basis. These considerations largely dictated the structure of the rating scale finally developed, which is shown in figure 2.

In the third area of criterion development—namely, investigation of the "qualify-disqualify" criterion, a study just completed yielded interesting subsidiary variables, some of which may be considered as predictors of the criterion, others as subsidiary criteria. For example, time to qualify and ratings at the time of qualification may have criterion possibilities, while education, time in service, and the more subtle variable of motivation for volunteering for the submarine service in the first place appear to have possibilities as predictors. During a recent experiment known as Operation Hideout, where 23 men were confined in a submarine for two months, a study was made to determine why they had volunteered to be subjects. It was learned by indirect means that one significant reason for volunteering was the person's desire to identify himself with something big or important. This motive may have arisen from feelings of inadequacy, insecurity, and unsatisfied achievement. It would appear that this has some general application to all volunteers for hazardous duty.

PREDICTOR RESEARCH

The present predictor combination is shown in the right-hand column of figure 1. It will be noted that the basic battery score is used, together with a personal history form and a group thematic apperception test. In the semistructured interviews, the medical officers make ratings of the listed factors on a 4-point categorical scale.

The group form of the thematic apperception test[7] is used as an interviewing aid to ascertain the presence or absence of serious unresolved conflicts. In spite of the absence of empirical validity for the value of this instrument, we have found that when there are salient deviations from the usual or standard stories to a particular picture, subsequent psychiatric examination usually reveals personality abnormalities which make the man a poor submarine risk.

Extensive investigations of our assessment interviews were made by Pashalian and Crissy,[8] in which 109 interviews were recorded and analyzed for content, speaking time patterns, and both intra-rater and inter-rater reliability; and 682 interview decisions were analyzed for validity against an immediate criterion of "pass-fail" in the basic submarine school. They found an inter-rater consistency of 98 percent and an accuracy of 95 percent in predicting graduation from the school. In passing it can be said that though 94 percent of the candidates in the school graduate, the screening of these men by interview raised this figure an additional percentage point to 95 percent. The validity is on the order of + .22.

Bartlett[9] explored the validity of the Navy basic battery as used during World War II in predicting submarine school grades. He found validities of + .35 to + .50 for basic submarine school and the electrical schools which follow it.

Wilson studied the validity of an experimental battery of tests, including the Navy basic battery, for both the school criterion and the technical phases of shipboard performance, as measured by practical performance tests. He reports validities of + .50 to + .60 for the school and + .40 to + .60 for the practical performance shipboard measures.

These comments are offered to indicate our present position in relation to the main problem—the prediction of successful adjustment and successful performance in submarines. I have not discussed criterion reliabilities; however, the school criterion shows a reliability of about + .60. The shipboard performance tests yield estimated reliabilities of + .80 and higher.

SUMMARY

Duty in submarines imposes unique demands and stresses which require that crews be carefully selected. Assessment of volunteers includes physical examination, psychologic tests, and an interview, in addition to performance in escape training and basic submarine school. Criterion and predictor research is based on the requirement for reliable criteria for predicting a successful submariner.

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"OPERATION RECOVERY"

MILTON R. WIRTHLIN, *Captain (MC) USN*

THE U. S. S. *Consolation* visited Chinhae, Korea on 11 and 12 January 1954, as part of the Korean rehabilitation program, to conduct a survey of the patients at the Republic of Korea Naval Hospital, with a view of embarking those Korean military patients who could be benefited by further treatment. I believe that a resume of the U. S. S. *Consolation's* visit and a report of the conditions encountered may be of interest to both civilian and military physicians.

Prior to our arrival at Chinhae, professional evaluation teams for general surgery, orthopedic surgery, neurosurgery, ophthalmology and otolaryngology, genitourinary surgery, internal medicine, and oral surgery were established to survey the various categories of patients and to select for transfer a maximum of 200. Upon arrival, the officer in command and members of the evaluation teams proceeded to the hospital for a conference with Captain Chuhyung Pak, Surgeon General, ROK Navy, and Captain Kiho Paik, Commanding Officer of the hospital. The purpose of our visit and the plan of operation were discussed and readily accepted by Captain Pak. At this time it was learned that the patient census was less than 500, of which about 157 were patients with active pulmonary tuberculosis hospitalized separately a considerable distance from the main unit.

When evaluation team members met their counterparts on the staff of the hospital, "Operation Recovery" was begun. Following each team's survey and consultation, its senior member gave Captain Pak a detailed report on the patients examined and an evaluation of their medical care.

RESUME OF TEAM FINDINGS

General surgery. There were two general surgical wards with a total of 83 patients. Consultation was requested on five patients, and two were presented for possible embarkation. The general surgical evaluation team saw each patient on this service and selected four for embarkation, three for reconstructive surgery, and one for diagnostic study and possible operation.

From the U. S. S. *Consolation*, FPO, San Francisco, Calif.

Of these 83 patients, 19 had had rectal operations, five had had operations for tuberculous lymphadenopathy of the neck, and nine had had appendectomies. Nearly all of the remaining 40 patients were ambulatory, and about 50 percent appeared in satisfactory condition for discharge or return to duty. The general surgeons at the hospital discussed their patients' conditions and they appeared to have rendered adequate surgical care. The main difficulties were lack of trained anesthetists, antiquated operating facilities, meager x-ray equipment, and a shortage of whole blood. Surgical technic and operating room procedures were not observed.

From right to left: Captain Kiho Paik, Commanding Officer of the ROK Naval Hospital, Chinhae; Captain Chubyung Pak, Surgeon General of the ROK Navy; and Commander E. J. Jaruszewski (MC) USN, supervise transfer of ROK military patients to the U. S. S. Consolation.

Orthopedic surgery. There were two orthopedic wards with about 60 patients under treatment. Consultation was requested on 31 patients, and seven were presented for possible embarkation. Forty-three patients were seen in consultation, and three were accepted for shipboard treatment. The other four, presented for possible embarkation but not accepted, were patients with chronic osteomyelitis which, characterized by minimal drainage from the sinuses and an absence of systemic symptoms, did not warrant operation at this time.

The treatment efforts of the hospital's physicians appeared directed principally to patients with recent fractures and dislocations, while the treatment of patients with orthopedic problems requiring prolonged care seemed of secondary interest. Conservative treatment of patients with fractures, either by plaster immobilization or traction, was not observed. Lack of fracture beds and inability to improvise them probably accounted for the number of open reductions performed on patients with recent fractures. The incidence of postoperative wound infection appeared high. Atrophy from disuse, involving bone and soft tissues, was apparent—due probably to improper support of the patients

The neurosurgeon (center) from the Naval Hospital in the U. S. S. Consolation *examining a patient with the neurosurgeon (right) of the ROK Naval Hospital, Chinhae, Korea.*

while in plaster casts, too early discontinuance of plaster immobilization, failure to ambulate patients in casts, or insufficient and improper use of the adequate physiotherapy equipment.

In defense of the orthopedic staff it should be mentioned that, because they were interested only in obtaining consultations on their problem cases, their patients showing good results were not seen.

Neurosurgery. There were two neurosurgical wards with about 65 patients. Consultations were requested on 56 patients, and

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four were presented for possible embarkation. The neurosurgical evaluation team examined and offered technical advice on 65 patients. Of the four presented for possible embarkation, one was a paraplegic secondary to arachnoiditis who had been explored surgically; another had paraplegia of eight months' duration secondary to lumbar cord injury; the third was a questionable case of Raynaud's disease, but sympathectomy was not justified until adequate therapy would rule out the possibility that a fungus infection of the fingernails might be a contributing factor to his difficulty; the fourth was a patient with a peripheral nerve injury with returning function, merely requiring continued physiotherapy to correct the contractures.

The majority of the patients seen in consultation had peripheral nerve injuries, and almost all showed evidence of recovering function. Neurosurgical care was good; however, again the chief criticism was the lack of active physical therapy.

Ophthalmology and otolaryngology. There was one ward assigned to this service with about 19 patients. Consultation was requested on 16 patients with diseases of the ear, nose, or throat, and three with diseases of the eye. No patients were presented for possible embarkation. All of the 16 patients were receiving excellent care and the majority were ready for duty.

Urology and dermatology. This service shared a ward with the oral surgery service. Three patients with urologic conditions were presented for consultation, and two of these were embarked for further diagnostic study. The urologists on the hospital staff seemed well trained and presented evidence of their technical ability. They were unable, however, to perform cystoscopic examinations because their only cystoscope was inoperable. No dermatologic cases were presented for consultation or embarkation.

Oral surgery. There were only seven patients in the oral surgery ward, and consultation was requested on one. This patient had a simple fracture of the left mandible without artery or nerve involvement. The fracture union was firm and dental occlusion good. Further treatment was not indicated and it was recommended the patient be discharged to duty.

Internal medicine. The medical service had a census of 56 patients, including psychiatric patients. Patients with tuberculosis were hospitalized in a separate unit. Ten patients were presented for consultation but none for embarkation. Three patients presenting diagnostic problems were selected for embarkation, clinical studies, and treatment. The patients examined were a representative cross section of those usually seen in any military hospital. Each case was discussed thoroughly from diagnostic, therapeutic, prognostic viewpoints, and disposition.

The internists appeared to be performing excellent work in spite of the lack of modern diagnostic, therapeutic, clinical, or laboratory aids. The supply of drugs was inadequate at the time of our visit, and no insulin was available.

Tuberculosis service. The tuberculosis service had a census of 157 patients; 146 of these were suffering from pulmonary tuberculosis, of whom 74 had bilateral involvement. Consultations were requested on 11 patients, and 10 were intended for embarkation and surgical procedures. With one exception, all these had advanced bilateral pulmonary tuberculosis. Pneumothorax and pneumoperitoneum as well as combined chemotherapy had been used with indifferent results. In some cases, planned therapy had been in progress for too short a time to determine the value of this regimen. The patient with unilateral disease presented for embarkation had had an ineffective pneumothorax, and might be a candidate later for thoracoplasty or resection. The other patients presented for embarkation, not considered for surgery because of active contralateral involvement or acute exudative disease, were doing well on combined chemotherapy and temporary collapse.

Accepted standards of temporary collapse, pneumothorax, and pneumoperitoneum were used, as well as streptomycin, para-aminosalicylic acid, and isoniazid (isonicotinic acid hydrazide). Lack of adequate case-finding facilities apparently results in the majority of patients with tuberculosis being admitted in advanced stages of the disease.

SUMMARY OF OBSERVATIONS

The structural plant of the hospital was old and in a poor state of repair. Few buildings had steam heat, but most wards were heated by one or more oilstoves. The efficiency of the heating units was impaired by many broken windows and ill-fitting or missing doors. Sinks, including operating room scrub-up sinks, consisted mostly of unfinished concrete basins. Piping and fittings were old, and many leaks were in evidence. Ward washrooms were unheated and crude. Laundry facilities were notable by their absence.

Operating rooms were primitive by American standards, and inadequate even by prewar Korean standards. Floor tile was in disrepair, and safety devices were absent. Overhead operating lights and autoclaves, while old fashioned, appeared to function well. The operating tables were of the army field type. Lighting was poor throughout the hospital; wiring was crudely installed, and in many places was bare of insulation. Power fluctuations and failures are frequent, and interfere with the operation of diagnostic equipment, x-ray machines, et cetera.

Galley facilities were not inspected and food service not observed. Technical equipment was scant throughout the hospital. X-ray facilities consisted of one U. S. Army type field unit; however, in spite of electric current fluctuations, satisfactory roentgenograms were demonstrated. Physiotherapy equipment for the most part was improvised, but the hydrotherapy equipment was modern, and all equipment was capable of being used with effective results. Hospital beds were either iron or wooden cots, and no fracture or modern hospital beds were available. Dressing carts were primitive and poorly equipped for aseptic technic. Diagnostic units and surgical instruments were scant; no apparatus was available to obtain metabolic determinations or electrocardiograms.

The professional staff appeared to be performing excellent work in spite of the above-mentioned handicaps. Nursing care and over-all cleanliness of wards appeared adequate under the circumstances. All medical officers, especially the heads of departments, were well trained and discussed their cases intelligently. The fact that only 12 Korean military patients were selected for embarkation for further diagnostic studies and surgical procedures speaks well of their professional staff. Administratively, the hospital organization was sound and functioning well with limited funds.

CONCLUSIONS

All participating officers believed that their first-hand observation of a ROK naval medical facility, the mutual exchange of technical ideas on 281 clinical patients, and the U. S. Navy's offer to be of assistance made "Operation Recovery" well worth while, and did much to foster a mutual admiration between the Medical Corps of the two countries.

CONSULTANT IN KOREA

In the early summer of 1953 I had the opportunity of going to the Far East as a Surgical Consultant to the Surgeon General (of the Army)* * * I came home glad above everything else that I am an American. I brought with me vivid memories of the "shooting war" I had witnessed; overwhelming admiration for the young medical officers in our armed services; a great respect for the brotherhood of doctors everywhere; a determination that my children shall study other languages and learn tolerance of other people's countries and customs; a taste for green tea; skill with chopsticks; a new Contax camera; 1,000 color pictures—at least half out of focus; my Ridgeway cap; and an empty pocketbook.

—T. G. BLOCKER, Jr., M. D.

in *Plastic and Reconstructive Surgery*, pp. 1 and 8, Jan. 1954

Peripheral Facial Paralysis Treated With Cortisone

AARON M. BERNSTEIN, *Lieutenant, USAF (MC)*

UNTIL recently the treatment for peripheral facial paralysis (Bell's palsy) has consisted of splinting the muscles involved, gentle massage, electrical stimulation, and the administration of various vitamin preparations. It is believed that cortisone lessens the acute edema and inflammatory reaction of the facial nerve and its sheath as it passes through the fallopian aqueduct. Rothendler[1] obtained excellent results with cortisone in the treatment of six out of seven patients with Bell's palsy, and Robison and Moss[2] successfully treated two patients suffering in the early stages of the condition.

CASE REPORT

A 20-year-old airman who entered this infirmary on 12 January 1954 gave the following history. On 4 January, while on the job, he noted a numbness over the left side of his face and found that he could not close his left eye completely. During the week his symptoms became worse, the numbness over the left half of the face increased, he could not whistle, his mouth was pulled to the right upon smiling, his taste sensation diminished and food tasted peculiar, the left side of his forehead would not wrinkle upon frowning, and his left eye would hardly close.

Physical examination revealed a well-developed Negro who could not wrinkle the left side of his forehead, his left eye would not close completely, the nasal fold on the left was flattened, and his mouth was pulled to the right, and there was numbness over the left side of the face. The remaining part of the neurologic examination was not contributory. There was tenderness in front of the left ear.

The patient was hospitalized on 13 January 1954 and given 50 mg. of cortisone three times a day. On 14 January he received 50 mg. twice a day; on 15 January, 25 mg. three times a day; and on the following two days, 25 mg. of cortisone twice a day. No other treatment was given thereafter. On 15 January the patient

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noted that the numbness of the left side of his face was diminishing. During the next two days marked subjective as well as objective improvement was noted. His left eye would close, he was able to wrinkle his forehead, and he could whistle. By 20 January 1954 there were no objective signs of seventh nerve disturbances. The patient stated he could feel nothing unusual in his facial movements. He was seen a week later, and a month after that, and nothing unusual had occurred.

COMMENT

The speed with which this patient reacted so favorably tends to support the reports by Rothendler and by Robison and Moss, that the use of cortisone is promising in the treatment of peripheral facial paralysis.

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HIGH ACCIDENT RATE AMONG WOMEN

Accidents take a heavy toll of life among women. In our country more than 22,000 women at ages 15 and over die each year as a result of injuries sustained in accidents. Even in the age range from 15 to 64—before the infirmities of age begin to play an appreciable role in mishaps—the annual toll is 10,000. More women at these ages die from accidents than from any other cause except the cardiovascular diseases and cancer.

It is rather surprising that only one quarter of the fatal accidents among women under age 65 occur in and about the home, in view of the large proportion of time that women spend there. Modern equipment and appliances, among other improvements, have made the American home a much safer place in which to live. Motor vehicle mishaps constitute the major hazard, accounting for more than half of all accident fatalities among women. Public places other than streets and highways are the scene of almost all the remaining deaths. Although many millions of women in our country are in the labor force, with large numbers engaged in factory work, few are killed in industrial accidents; less than one percent of the fatal accidents among women at the main working ages of life arise out of and in the course of employment.

—from *Statistical Bulletin*, Mar. 1954.

Can Molluscum Contagiosum Be a Venereal Disease?

EDWARD F. GUDGEL, *Major, MC, USA*

OVER the past several years, I have observed many cases of molluscum contagiosum exclusively located on the genitalia of young soldiers. The majority of these men had had repeated intercourse with Korean prostitutes and a few had had sexual intercourse both in Korea and the United States before the lesions were noted. Ormsby and Montgomery[1] stated, "In occasional instances, patients mistake these lesions when situated upon the genitalia for some form of venereal infection, but this is soon corrected when examined by a physician." Using

Figure 1. Lesions of molluscum contagiosum on the shaft of the penis.

the definition of venereal literally, "Due to or propagated by sexual intercourse,"[2] it must be considered that this is indeed a venereal disease in these cases. MacLeod and Muende[3] stated that the "inoculation experiments with the virus have resulted in the formation of the typical pearly tumor after an incubation period varying from two to seven weeks." Many of the soldiers now being seen had not noticed the lesion for many months after

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their last exposure in Korea. Therefore, unless specific inquiry about such exposures is made, one will be unaware of the sexual significance of the lesion.

The lesions are easily recognized as small translucent or skin-colored wartlike tumors with a central umbilication from which creamy sebaceouslike material can be expressed (fig. 1). Biopsy specimens of the lesions presented the typical pathologic picture. All lesions were treated with simple desiccation and curettage.

Barrett and associates[4] recently reported 70 men with genital warts (condyloma acuminatum) stationed at Camp Atterbury, Ind., 65 of whom had been stationed in Korea and Japan and admitted contact with native women. Twenty-four wives, whose husbands admitted sexual relations with native women, also had similar lesions. This study indicates a similar mode of infection in the transmission of molluscum contagiosum and is corroborative evidence of its venereal classification.

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PREVALENCE OF PROSTATIC CARCINOMA

The remarkably high incidence of carcinoma of the prostate in men more than 50 years of age is probably not yet fully appreciated by many in the medical profession. Incidences ranging from 15 to 30 percent have frequently been reported in routine autopsies of men in the older age brackets. This means that in nearly one third of the male population over 50 there is a possibility of the development of prostatic carcinoma. It would also indicate that, at present, between 3,000,000 and 5,000,000 men in the United States probably have carcinoma of the prostate. Carcinoma is the cause of prostatic obstruction in approximately one-fifth of cases of the latter condition encountered clinically.

—W. E. KITTREDGE, M. D.
in *Journal of the International College of Surgeons,*
p. 218, Feb. 1954

Cryptitis With Pinworm Infestation

CHARLES F. AQUADRO, *Lieutenant, junior grade (MC) USNR*

INFESTATION of the rectal sinuses with *Enterobious vermicularis (Oxyuris vermicularis;* pinworm) is a sufficiently unusual cause of cryptitis so that the diagnosis is likely to be missed unless the possibility of such infestation is borne in mind. In the case described below, the cause of the cryptitis was assumed to be impacted particles of feces or a similar condition until the worms were revealed at operation.

CASE REPORT

A 20-year-old man was admitted to this hospital on 9 September 1953 complaining chiefly of intermittent, pronounced perspiration and burning around the anal region, "as sweat in an open cut," for the previous two years. These intermittent periods of pruritus and perspiration had been occurring more frequently and lasting longer (four or five days at a time) for six months prior to this hospital admission. The patient had noticed an occasional brownish watery drainage from the anus which stained his underclothing and was associated with blood streaking on the toilet tissue after bowel movements. He also had experienced a rather intense anal pruritus with an associated "crawling-like" sensation for brief periods after defecation, but no symptoms at night or between bowel movements. There had been no diarrhea, constipation, dyschezia, nausea, or vomiting. Mild abdominal pain occurred only after emotional crises.

The past history, family history, and review of systems were noncontributory, and no abnormalities were noted on physical examination. Urinalysis, complete blood count, and roentgenogram of the chest were within normal limits. No elevated eosinophil count or leukocytosis was noted, even on repeated studies. Anoscopic and sigmoidoscopic examinations revealed only hypertrophied anal papillae and small internal hemorrhoids in the primary planes.

On 18 September hemorrhoidectomy and cryptectomy were performed. On excision of the anal crypt over the left lateral hemorrhoid, two pinworms were found. Exploration and excision of other crypts revealed no additional enterobius.

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Despite several postoperative examinations for ova and parasites in stool specimens and the making of cellulose tape slide studies, no other evidence of pinworm infestation was noted. The patient was started on a course of enteric-coated methylrosaniline chloride (gentian violet) tablets as treatment for enterobiasis, and was discharged to duty following healing of the operative site. Shortly thereafter he was released from the service, so that follow-up reports are not available.

DISCUSSION

Cryptitis. Cryptitis, which is characterized by inflammation of the crypts of Morgagni,[1] is usually found in association with anal papillitis.[2] The anatomic arrangement of the crypts, with their openings facing upward toward the rectum, is a predisposing cause of inflammation and infective processes in the anorectal region. The crypts become nidi of infection from particles of feces, mucous secretions, and foreign bodies.[3] They may contain pathogenic bacilli, flagellates, coccidia, amebas, or segments and eggs of helminths. The crypts of Morgagni also furnish starting points for most infectious anorectal disease. Cryptitis is the most frequent cause of anal fissure; it is a factor in causing pruritus ani, and often is the initial cause of hemorrhoids. Infected crypts may serve as loci of internal openings of anal fistulas. Cryptic infestation with *E. vermicularis* may lead to an ischiorectal abscess due to burrowing of the parasites through the anorectal mucosa.

The pain caused by cryptitis is usually sharp or burning, less frequently a dull ache. It is usually increased by defecation, after which a feeling of discomfort or uneasiness may develop. The patient dreads a bowel movement, and constipation may arise from postponement of defecation. Itching, often not relieved by scratching, is another symptom. There may be a sensation also of crawling, aggravated by perianal moisture. A mucoid or mucopurulent anal discharge from the crypts may represent inflammatory exudate or result from reflex stimulation of the mucosa. Reflex pain may be referred to the urogenital area, the sacrum, the coccyx, or down a lower limb.[1]

The diagnosis of cryptitis is made by digital and anoscopic examination. On digital examination, a tight anal sphincter is usually encountered, together with thickened, granular, or inflamed crypts. On anoscopic examination, the crypts are exposed, and crypt hooks can be inserted for better exposure.[2] Early diagnosis and treatment of cryptitis may prevent such complications as papillitis, perianal abscesses, fistulas, ischiorectal and retrorectal abscesses, fissure, and pruritus ani.[1]

The treatment of cryptitis may be palliative or surgical. Palliative care consists of local cleansing with warm rectal irrigations, applying caustics, use of ichthammol (ichthyol) suppositories, sitz-baths, softening the stools by use of mineral oil by mouth, and a nonconstipating diet. Surgical treatment is excision of the involved crypts.[2]

Enterobiasis. Enterobiasis has been known to exist since ancient times. The worm is widely distributed, but is more common in warm climates.[4] The male worm has a length of from two to five millimeters; the female, from eight to thirteen millimeters. They are both spindle-shaped in the adult form.[5] "The adult worms inhabit the cecum, appendix, and adjacent portions of the ascending colon and ileum."[4] "*E. vermicularis* requires neither an intermediate host nor a period of incubation outside the body. The intense itching, produced by the gravid females crawling out the anus" onto the perineal and perianal region to deposit their eggs, leads to scratching the involved area. Eggs are scraped up by the fingernails and eventually get into the mouth by way of the fingers. Since the pinworm ova resist drying, they may remain attached to soiled bed linen or clothing, and infection may be spread by handling these articles.

In brief, the life cycle begins with the embryonated egg in the duodenum. The egg hatches and the larva spends about two months in the small intestine. Here the worm mates and passes into the large intestine, where it attaches to the mucosa and develops into adulthood. When the adult female becomes gravid, it releases its hold on the wall of the intestine and passes into the rectum, out of the anus, and oviposits on the perianal or perineal region. The eggs may be transferred to the mouth as described above, and the cycle is repeated.[5]

The adult worm in the lumen of the bowel or appendix, by mechanical means or by lysis, may cause hemorrhage. Catarrhal inflammation of the mucosa may allow entrance of secondary pathogens. Pruritus ani is probably the most distressing symptom of pinworm infestation, and the scratching provoked by the pruritus may result in local hemorrhage, eczema, and pyogenic infection of the anal and perianal regions. If the worms infest the rectum in sufficiently large numbers, violent rectal colic may be produced. They often enter the vagina, especially in children,[6] from the perianal region, pass through the uterus into the fallopian tubes, and thus cause salpingitis. Parasites may continue on through the tubes and even enter the peritoneal cavity where they become encysted in the peritoneum.[5]

In infants and children, and to a certain extent in adults, nervous symptoms of various types have been attributed to pin-

worm infestation.[5] Anorexia, nausea, vomiting, and diarrhea may occur, along with reflex irritation of the genitalia, abdomen, and legs.[7]

Diagnosis is usually made by finding either the worms or their ova[7] in material scraped from the perianal area,[2] but adult worms may be discovered in the perianal region or in the feces, particularly after an enema. Ova are frequently obtained from fingernail scrapings, but are seldom found in the feces even with concentrative methods.[7] Best results are obtained by swabbing the perineal skin the first thing in the morning, before a stool is passed and before a bath is taken. The swab may be a one-inch square of cellophane, folded over one end of a glass rod and held to the rod by a rubber band, or cellulose tape, adhesive side out, on the end of a wooden tongue blade. The latter is simpler to use, the tape being removed after swabbing and placed, adhesive side down, on a microscope slide for direct examination. Repeated examinations on nonconsecutive days should be made before the patient is considered free from infection.

Chenopodium oil preceded by a purgative, tetrachloroethylene, and hexylresorcinol has been of some success in the treatment of patients with pinworm infestation. However, the most reliable and most successful therapeusis consists of the oral administration of tablets or capsules of methylrosaniline chloride. The adult dosage is 60 mg. three times daily for eight days. Then the patient rests a week and repeats the treatment.[4] Careful search for continuing presence of adult worms is essential before therapy is terminated.

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The Problem of Respiratory Insufficiency in Poliomyelitis

CHARLES H. MORHOUSE, *Colonel, USAF (MC)*

THE reports by Lassen[1] and Ibsen[2] of the recent epidemic of poliomyelitis in Copenhagen and how the problem of respiratory insufficiency was handled suggest that an evaluation of procedures and equipment is desirable for every military hospital before the actual onset of the so-called "polio" season. It is fairly well established that the present trend of the disease in temperate climates is one of an increased attack rate on adults and in such cases respiratory insufficiency is far too common. Tank respirators are costly and as a rule are not available in great numbers either in a single military hospital or in a military area. When they are available, results from their use are not always satisfactory and nursing problems arise. Fatality rates, especially in bulbar cases, have always been high. Cuirass respirators are also in short supply. This article is written to call attention to the improvisation of pressure breathing apparatus from equipment usually on hand to augment such mechanical respirators as are in stock.

In the Copenhagen epidemic, a 500-bed hospital equipped with one tank and six cuirass respirators admitted more than 3,000 polio patients in five months. At the peak, 50 patients were received daily of whom one third were paralytic. To care for the patients with respiratory insufficiency it was necessary to improvise a type of apparatus for positive pressure breathing. After a tracheotomy was performed below the larynx a double tube with a rubber cuff was inserted into the trachea to permit manual positive pressure breathing. As Lassen and Ibsen stated, after this method was tried it became the treatment of choice and it became no longer necessary to face the decision of which patient should be given a chance to survive in one of the mechanical respirators which were limited in number.

The essential equipment used was a mixture of equal parts of oxygen and nitrogen from a cylinder connected through a humidifier by means of a reducing valve. A side branch of the cuffed tubes was connected with a metal container of soda lime. A rubber bag and control valve were used to regulate pressure. Suction-

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ing of secretions was done through a second tube of the rubber cuff. By means of this hurriedly designed equipment, and with nurses and medical students to manually ventilate the patients, 232 patients with respiratory insufficiency were treated. The mean mortality rate in these was 39 percent; previous to the institution of such treatment the mortality rate had been 80 percent.

In a situation requiring additional help for patients in respiratory difficulties the average Air Force hospital has, over and above any tank or cuirass respirators, resuscitators and anesthesia machines. These are both better for use on patients with bulbar paralysis whether associated with intercostal or phrenic paralysis, or as a separate entity.[3]

The resuscitator is a standard item of issue to military hospitals. The unit carries its own suction pump which can be adapted by means of a short piece of tubing to make an endotracheal catheter. Three sizes of facepieces and airways are available, and the unit can be attached to either a "G" or "H" oxygen cylinder. The resuscitator will serve only for transportation or emergency treatment unless it is adapted to provide a humidifier which is essential for continuous positive ventilation. Barach[4] stated that humidity of at least 35 to 55 percent is necessary to prevent drying of the patient's respiratory mucous membranes.

Anesthesia machines are items of issue and may be of several designs and makes. From 300 to 400 cc. of oxygen per minute is supplied and from 250 to 300 cc. of carbon dioxide is absorbed as it is exhaled through soda lime, which should be replaced at least once every four hours. Should the equipment be used by a patient with poliomyelitis, the tank of nitrous oxide must be removed to safeguard against its accidental use. With a closed circuit,[5] humidity is not a problem but more moisture can be provided by filling the ether jar two thirds full of clean water or normal saline solution. Patients requiring positive pressure breathing do better if a low, elective, large tracheotomy is performed early. A cuffed endotracheal tube with its beveled end cut square is then passed through the tracheotomy and the cuff is inflated. Personnel must be assigned continuously to breathe for the patient by manually compressing the breathing bag from 18 to 20 times per minute. Secretions can be handled by frequent suction and even bronchoscopy can be performed through the tracheotomy. Endotracheal tubes should be removed and cleaned at least twice a day.

The most logical way to determine what is occurring in the bronchial tree of a patient is to perform as near direct auscultation as possible. Again, standard equipment can be of great

value. This can be accomplished by using a throat microphone attached to the patient and hooked up through an amplifier using either standard 110 volts or a battery, which can be done by most radio mechanics. The amplifier can be placed in any selected location and constant observation can be made of the condition of the patient's bronchial tree. Indications for suction and for forced ventilation can be detected early by this simple device.

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REGULAR MEDICAL CORPS OFFICERS CERTIFIED BY SPECIALTY BOARDS

The American Board of Anesthesiology

Since its activation in 1937, the American Board of Anesthesiology has certified more than one thousand physicians in this specialty. At present, according to the respective Surgeons General, this number includes 22 regular Medical Corps officers, who are:

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This is the eleventh of a series. The names of officers certified by the American Board of Surgery will be published in the September issue.

CIVILIAN HEALTH AND ADVISORY COUNCIL TO ASSISTANT SECRETARY OF DEFENSE

New and retiring members of the Civilian Health and Medical Advisory Council to Frank B. Berry, M. D., Assistant Secretary of Defense (Health and Medical) were photographed at a meeting at Letterman Army Hospital in San Francisco on 25 June 1954. Seated, left to right, Former Assistant Secretary of Defense Melvin A. Casberg, Solvang, Calif., Alfred R. Shands, M. D., Wilmington, Del., James P. Hollers, D. D. S., San Antonio, Dr. Berry, Dwight L. Wilbur, M. D., San Francisco, I. S. Ravdin, M. D., Philadelphia, Anthony J. J. Rourke, New Rochelle, N. Y. Standing, James P. Fox, D. D. S., Philadelphia, Howard K. Gray, M. D., Rochester, Minn., and alternate members James L. Tullis, M. D., Brookline, Mass., and James E. McCormack, New York.

Doctors Shands and Hollers, retiring members of the Council, have served for more than four years as advisors to the Department of Defense and both will continue as consultants to Dr. Berry. Dr. Hollers, one of the original members of the former Armed Forces Medical Policy Council, has been succeeded by Dr. Fox, and Dr. Shands by Dr. Casberg.

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*Oak Leaf Cluster.

The names of officers of the medical services who have been awarded decorations by the United States Army, Navy, or Air Force are published in this department each month following receipt of information from official sources.—*Editor*

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DR. RAVDIN ELECTED 1955 CHAIRMAN OF A. M. A. SECTION ON MILITARY MEDICINE

Brigadier General I. S. Ravdin, MC, USA (Ret.), succeeded Major General Harry G. Armstrong, USAF (MC) as chairman of the Section on Military Medicine of the American Medical Association at the close of the annual meeting in San Francisco in June. Rear Admiral Lamont Pugh, Surgeon General of the Navy, was chosen vice chairman and Colonel Charles L. Leedham, MC, USA, secretary.

Present and former officers of the A. M. A. Section on Military Medicine, left to right: Col. Charles L. Leedham, MC, USA; Rear Admiral Lamont Pugh (MC) USN; Rear Admiral Richard A. Kern (MC) USNR; Brigadier General I. S. Ravdin, MC, USA (Ret.); Major General Harry G. Armstrong, USAF (MC); and Former Assistant Secretary of Defense (Health and Medical) Melvin A. Casberg.

Dr. Ravdin is a member of the Civilian Health and Medical Advisory Council to the Assistant Secretary of Defense (Health and Medical). The other members of the Executive Committee of the section are the two immediate past chairmen, General Armstrong and Rear Admiral Richard A. Kern (MC) USNR, Philadelphia, Pa., and the A. M. A. delegate, Colonel Russell V. Lee, USAF (MC), Palo Alto, Calif.

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A MESSAGE FROM THE A. M. A.

In April this message was devoted to a summary of the interest and activities of the American Medical Association in connection with the enactment, amendment, and general administration of the "Doctor Draft Law." Because Public Law 84, 83d Congress, prescribed only *maximum* periods of service, the Association requested that the Department of Defense administratively reduce the period of service required of priority II physicians on active duty provided they had served 12 months or more during World War II. A letter was sent to the Department of Defense on 27 April 1954 calling attention to this situation.

A reply dated 7 May was received from Dr. Frank B. Berry, Assistant Secreatry of Defense. Because of the inquiries which the Association and the Council on National Emergency Medical Service of the American Medical Association have received following the article in the April issue, Dr. Berry's letter is reproduced with his permission:

It has been the policy of the Department of Defense since the enactment of Public Law 779 to require physicians brought to duty to serve the maximum period prescribed by law. At the time amendments to Public Law 779 were being considered by the House Armed Services Committee and the Senate Armed Services Committee, during the spring of 1953, the maximum period of service to be required of Priority II physicians was established after full consideration was given to all facets of the problem. In addition, concern has been expressed by agencies such as the Health Resources Advisory Committee, Office of Defense Mobilization, regarding the depletion of the pool of available physicians in civilian life who are obligated for duty under the Doctor Draft Law. Early release of medical officers on active duty would result in increased levies on civilian physicians. After considering these and other aspects of the problem, it is believed that the Department of Defense policy of requiring the maximum period of service prescribed by law is consistent with the continuing necessity to bring physicians to duty from civilian life, the interests of the Armed Forces, and recommendations received from official agencies concerned.

As you know, shortly after the enactment of Public Law 779, during the fall of 1950, Department of Defense policy was established defining the basis upon which rank would be accorded physicians who applied for reserve commissions in lieu of induction. It was the intent of the Department of Defense to provide these physicians with the highest grades practicable. Accordingly, and as a criteria which could be uniformly applied, length of professional experience was made the basis for the rank to be received by physi-

From the Council on National Emergency Medical Service of the American Medical Association.

cians and other professional personnel brought to duty under the law. At the time changes to the Doctor Draft Law were being considered by the 83d Congress, legislative proposals were made by the Department of Defense resulting in the language quoted in your letter as Section 4(a) of the Universal Military Training and Service Act, as amended. It was the intent of the Department of Defense, by appropriate changes to then existing provisions of Public Law 779, to establish by law the policy basis for according rank to civilian physicians upon accepting reserve commissions; and to emphasize that reserve officers called to active duty under provisions of the law be given an equal grade to that accorded civilian physicians. The words "reappointed, or promoted" were not proposed by the Department of Defense to provide separate actions but rather to define two methods of accomplishing one action; namely, the adjustment of grades of reserve officers upon entrance of active duty.

The problem of promotion of physicians after entrance upon active duty is one to which consideration and study has been given at various times during the current emergency. The total number of officers in each grade in each military department is limited by law. In order to promote an officer from one grade to the next higher grade based on experience while on active duty, vacancies must exist in that grade. When vacancies exist in a military department that would permit promotion of officers, consideration must be given to the military needs for officers in all components in the higher grade and to the opportunities afforded for promotion of all officers. Early in the history of the current emergency, when the Armed Forces were rapidly expanding, promotion was relatively rapid for officers of all components. During this period, few, if any, complaints were received from medical officers concerning slow rate of promotion. At the present time the Armed Forces is contracting; the number of officers in each grade has been reduced; and, of course, opportunities for promotion is greatly lessened. For these reasons automatic promotions of medical officers after entrance on active duty, based solely upon accumulation of professional experience, is not practicable.

It is true, under the present system, that a physician who is delayed in his call to active duty may gain advantage over a contemporary physician who has entered service at an earlier date. Under the terms of the Doctor Draft Law delay is directed when the service of a physician in his civilian capacity is essential in the interest of national health, safety and welfare. The law provides for a National Advisory Committee to the Selective Service System to make recommendations pertaining to such delays. The advantage that an individual may gain who is delayed under this provision is considered consistent with other factors of the law which determine priority for obligation for duty on other criteria than the time of graduation from medical school.

May I assure you that the problems which you have presented have been earnestly studied by interested divisions of the Office of the Secretary of Defense and by the military departments. I trust that these explanations will serve to clarify the position of the Department of Defense with respect to these problems.

CORRESPONDENCE

To the Editor:—I am writing to tell you that it is a pleasure to receive my copy of your *Journal,* and that I have found myself reviewing the issues which have reached me during the past year, with increasing pleasure and interest.

In the June 1954 issue, I particularly enjoyed the book review section, both for the broad selection of books reviewed, and for the fact that the reviewer has been allowed to express himself freely and in an interesting way.

It seems to me that the *Journal* is now filling a unique place in medical literature, as it should do, with a good selection from the broadest field available to any editor, a succinct style of writing and indications of excellent proof-reading. It is a pleasure to me to be able to compliment you on the quality of the *Journal.*

ELBERT L. PERSONS, M. D.
Duke University School of Medicine
Durham, N. C.

RETIREMENT AFTER TWENTY YEARS SERVICE

(The following letter, recently received by Dr. Frank B. Berry, Assistant Secretary of Defense (Health & Medical), is published with the writer's permission.—Editor)

Dear Sir:

I am writing you as one doctor to another and as a doctor who served in the armed forces during World War II. I recall your message in the *U. S. Armed Forces Medical Journal* of April 1954 in which you advocate the implementation of a long-range medical incentive program to attract young doctors into the armed forces as a career. You stated, "The first and simplest step might be the reintroduction of the 20-year retirement privilege." Your statement, with which I heartily agree, is the whole purpose of this letter.

I have followed the "Arends Bill" through Congress because of my interest in the problem and because Congressman Arends is from Illinois. The bill passed both houses by substantial majorities. It seems that now comes the implementation of the intent of Congress and that some one is going to make "Doctors" an exception and not permit 20-year voluntary retirements as was voiced during the hearings on the bill and which is contrary to your announcement in April 1954.

Every member of our group of doctors has served in the armed forces during World War II. We are interested in this bill as reserve medical officers who desire to see a career in the armed forces be made more attractive for doctors. Since you are the highest doctor in the Federal Government, it is hoped you will do everything possible to allow 20-year voluntary retirements.

LEO J. BROWN, M. D.
The Carbondale Clinic
Carbondale, Ill.

ARMED FORCES MEDICAL LIBRARY

(The following letter was recently received by Lt. Col. Frank B. Rogers, MC, USA, Director, Armed Forces Medical Library.—Editor)

Dear Sir:

I should like to acknowledge my appreciation of the Armed Forces Medical Library. During my tours of duty at remote stations, the photostatic copies of reprints supplied by the library have helped greatly to furnish medical information and to supply knowledge of recent medical reports. While in the Washington area, the privilege of searching in the stacks has aided me in finding articles I had otherwise been unable to locate. The extraordinary completeness of the library with its tremendous number of journals has allowed me to review the literature on certain topics more completely than is possible through any other library.

Many of my medical colleagues have been unaware of the rare opportunities that the Armed Forces Medical Library has to offer them. It would seem in order to call their attention particularly to the privileges of obtaining photostatic copies of articles, for this service enables one to keep up in his field in spite of a remote location.

HUGO DUNLAP SMITH, Capt., MC, USA
U. S. Army Hospital
Fort Belvoir, Va.

THE PLACEBO IN PRACTICE

We must beware of prescribing the placebo to please the doctor rather than the patient; for a feeling that something has been done may blind us to any change in symptoms and may prevent that constant alertness so necessary to good doctoring. Nevertheless there is a not inconsiderable place for the placebo in medicine and, if intelligently used, I will defend it to the last drop in the bottle.

A. BARHAM CARTER, M. D.
in *Lancet*, p. 823, Oct. 17, 1953

NEW BOOKS

Books received by the *U. S. Armed Forces Medical Journal* are acknowledged in this department. Those of greatest interest will be selected for review in a later issue.

ATLAS OF OPERATIVE TECHNIC, ANUS, RECTUM, AND COLON, by *Harry E. Bacon,* M. D., Sc. D., F. A. C. S., F. R. S. M., F. I. C. S., F. A. P. S., Professor and Head of Department of Proctology, Temple University Medical School. Honorary Fellow: Royal Society Medicine (England), Bordeaux and Ambroise Paré Surgical (France), Madrid and Barcelona Surgical (Spain), Piedmontese Surgical (Italy), Venezuelan Surgical, Peruvian Surgical, Argentinian Surgical and Proctologic, Curitiba Surgical, Chilean Surgical, Brazilian Proctologic, and Dallas Southern Clinical Societies; Detroit Academy of Surgery. Diplomate, American Board of Surgery; Member, American Board of Proctology; and *Stuart T. Ross,* M. D., F. A. C. S., F. I. C. S., F. A. P. S., Attending Proctologist, Nassau Hospital, Mineola, N. Y., and Mercy Hospital, Rockville Center, N. Y.; Assistant Attending Surgeon in Proctology, Meadowbrook Hospital, Hempstead, N. Y.; Formerly Assistant Visiting Surgeon, Kings County Hospital, Brooklyn, N. Y., and Lecturer in Proctology, Polyclinic Medical School and Hospital, New York, N. Y. Secretary, American Proctologic Society; Diplomate and Member, American Board of Proctology. Miembro Correspondiente extrajero Sociedad Proctologia de Argentina; Honorary Fellow, Brazilian Proctologic Society. 301 pages; 403 illustrations. The C. V. Mosby Co., St. Louis, Mo., 1954. Price $13.50.

ANATOMY FOR SURGEONS: Volume 1, The Head and Neck, by *W. Henry Hollinshead,* Ph. D., Professor of Anatomy, Mayo Foundation, University of Minnesota; Head of the Section of Anatomy, Mayo Clinic, Rochester, Minn. 560 pages; 326 illustrations. Paul B. Hoeber, Inc., New York, N. Y., 1954. Price $12.

THE YEAR BOOK OF ENDOCRINOLOGY (1953-1954 Year Book Series), edited by *Gilbert S. Gordan,* M. D., Ph. D., Assistant Professor of Medicine, University of California School of Medicine; Assistant Physician, University of California Hospital; Consultant Endocrinologist, Langley Porter Clinic of the State Department of Mental Hygiene, San Francisco, Calif. 390 pages; illustrated. The Year Book Publishers, Inc., Chicago, Ill., 1954. Price $6.

THE HIDDEN CAUSES OF DISEASE, by *Antonio Benivieni* (1443-1502) of Florence. Translation by *Charles Singer,* with a Biographical Appreciation by *Esmond R. Long.* 217 pages; illustrated. Charles C Thomas, Publisher, Springfield, Ill., 1954. Price $6.75.

BEYOND THE GERM THEORY, The Roles of Deprivation and Stress in Health and Disease, edited by *Iago Galdston,* M. D. A New York Academy of Medicine Book. 182 pages; illustrated. Health Education Council, New York, N. Y., 1954. Price $4.

PRINCIPLES OF BIOCHEMISTRY, A Biological Approach, by *M. V. Tracey,* M. A., Rothamsted Experimental Station, Harpenden, Herts. 194 pages; illustrated. Pitman Publishing Corp., New York, N. Y., 1954. Price $4.

THE SYNTHESIS AND PHYSICAL-CHEMICAL PROPERTIES OF NEW AROMATIC AMIDINES, by *Martin Kuna* and *M. J. Kopac,* Department of Biology, Graduate School of Arts and Science, New York University, New York, N. Y. Annals of the New York Academy of Sciences, Volume 58, Article 3, pages 261-292. The New York Academy of Sciences, New York, N. Y., 1954. Price $1.

RESERPINE (SERPASIL) AND OTHER ALKALOIDS OF RAUWOLFIA SERPENTINA: CHEMISTRY, PHARMACOLOGY, AND CLINICAL APPLICATIONS, by *Fredrick F. Yonkman* and *Frank L. Mohr* (Conference Chairmen) and 34 other specialists. Annals of the New York Academy of Sciences, Volume 59, Article 1, pages 1-140; illustrated. The New York Academy of Sciences, New York, N. Y., 1954. Price $3.

NEUROSURGERY OF INFANCY AND CHILDHOOD, by *Franc D. Ingraham,* M. D., Associate Professor of Surgery, Harvard Medical School; Neurosurgeon-in-Chief, Children's Medical Center; Neurological Surgeon, Peter Bent Brigham Hospital, Boston, Mass.; and *Donald D. Matson,* M. D., Assistant Professor of Surgery, Harvard Medical School; Neurosurgeon, Children's Medical Center; Senior Associate in Neurological Surgery, Peter Bent Brigham Hospital, Boston, Mass. 456 pages; 482 illustrations. Charles C Thomas, Publisher, Springfield, Ill., 1954. Price $15.

PEDIATRIC PROBLEMS IN CLINICAL PRACTICE, Special Medical and Psychological Aspects, edited by *H. Michal-Smith,* Ph. D., Chief Clinical Psychologist, Flower and Fifth Avenue Hospitals; Research Associate in Pediatrics, New York Medical College, New York City; with 14 contributors. 310 pages. Grune & Stratton, Inc., New York, N. Y., 1954. Price $5.50.

LAUGHTER IN HELL, as Narrated to, and Written by *Stephen Marek;* Being the True Experiences of Lieutenant *E. L. Guirey,* USN and Technical Sergeant *H. C. Nixon,* USMC and Their Comrades in the Japanese Prison Camps in Osaka and Tsuruga. 256 pages; illustrated. The Caxton Printers, Ltd., Caldwell, Idaho, 1954. Price $5.

TEXTBOOK OF THE NERVOUS SYSTEM, A Foundation for Clinical Neurology, by *H. Chandler Elliott,* M. A., Ph. D., Associate Professor of Anatomy, College of Medicine, University of Nebraska; with an Introduction by *Wilder Penfield,* M. D. 2d edition. 437 pages; 158 illustrations and an atlas of 50 plates. J. B. Lippincott Co., Philadelphia, Pa., 1954. Price $9.

CLINICAL ORTHOPAEDICS, Number 3, *Anthony F. DePalma,* Editor-in-Chief, With the Assistance of the Associate Editors and the Board of Advisory Editors. 230 pages; illustrated. J. B. Lippincott Co., Philadelphia, Pa., 1954. Price $7.50.

TRANSFERENCE, Its Meaning and Function in Psychoanalytic Therapy, by *Benjamin Wolstein,* Ph. D., Clinical Psychologist, Low Cost Psychoanalytic Service, W. A. White Institute of Psychiatry, Psychoanalysis and Psychology; Psychologist, Therapeutic Services, Postgraduate Center for Psychotherapy, New York. Introduction by *Clara Thompson,* M. D., Executive Director, W. A. White Institute of Psychiatry, Psychoanalysis and Psychology. 206 pages. Grune & Stratton, Inc., New York, N. Y., 1954. Price $5.

A MANUAL OF OTOLOGY, RHINOLOGY AND LARYNGOLOGY, by *Howard Charles Ballenger,* M. D., F. A. C. S., Professor of Otolaryngology Emeritus and recently Chairman of the Department of Otolaryngology, Northwestern University Medical School, Chicago, Ill.; Surgeon, Department of Otolaryngology, Evanston Hospital, Evanston, Ill.; and *John J. Ballenger,* M. S., M. D., Associate, Department of Otolaryngology, Northwestern University Medical School, Chicago, Ill.; Member of the Surgical Staff, Department of Otolaryngology, Evanston Hospital, Evanston, Ill. 4th edition, enlarged and thoroughly revised. 365 pages; with 136 illustrations and 3 color plates. Lea & Febiger, Philadelphia, Pa., 1954. Price $6.

THE CAUSES AND TREATMENT OF BACKWARDNESS, by *Sir Cyril Burt,* D. Sc., Hon. Litt. D., Hon. Ll. D., Fellow of the British Academy; Honorary Fellow, Jesus College, Oxford; Emeritus Professor of Psychology, University of London; Formerly Psychologist to the London County Council. 128 pages. Philosophical Library, New York, N. Y., 1953. Price $3.75.

PSYCHOLOGY, THE NURSE AND THE PATIENT, by *Doris M. Odlum,* M. A. (Oxon.), B. A. (Lond.), M. R. C. S., L. R. C. P., D. P. M., Dip. Ed., Senior Psychiatrist, Elizabeth Garrett Anderson Hospital, London; Consultant Psychotherapist, West End Hospital for Nervous Diseases, London. 2d edition. 168 pages. Philosophical Library, New York, N. Y., 1954. Price $4.75.

HOW TO CHOOSE THAT CAREER, Civilian and Military, "A Guide for Parents, Teachers and Students," by *S. Norman Feingold,* Ed. D., Executive Director, Jewish Vocational Service of Greater Boston, and Part-time Instructor, Boston University. Illustrated by *C. Robert Perrin.* 52 pages. Bellman Publishing Co., Cambridge, Mass., 1954. Price $1.

HISTOPATHOLOGIC TECHNIC AND PRACTICAL HISTOCHEMISTRY, by *R. D. Lillie,* M. D., Medical Director, U. S. Public Health Service; Chief, Pathologic Anatomy Service, Clinical Center, National Institutes of Health; and Chief, Laboratory of Pathology and Pharmacology, National Institute for Arthritis and Metabolic Diseases. 501 pages. The Blakiston Co., Inc., New York, N. Y., 1954. Price $7.50.

A SYNTHESIS OF HUMAN BEHAVIOR, An Integration of Thought Processes and Ego Growth, by *Joseph C. Solomon,* Assistant Clinical Professor of Psychiatry, University of California; Consultant, Mount Zion Hospital, San Francisco, Calif. 265 pages. Grune & Stratton, Inc., New York, N. Y., 1954. Price $5.50.

SURGICAL UROLOGY, A Handbook of Operative Surgery, by *R. H. Flocks,* M. D., Professor and Head, Department of Urology, and *David Culp,* M. D., Assistant Professor of Urology, State University of Iowa College of Medicine. Illustrated by *Paul Ver Vais.* 392 pages; illustrated. Year Book Publishers, Inc., Chicago, Ill., 1954. Price $9.75.

ALCOHOLISM, by *Jackson A. Smith,* M. D., Director of the Alcoholic Clinic, Jefferson Davis Hospital; Assistant Professor of Psychiatry, Baylor University College of Medicine, Houston, Tex.; Diplomate of the American Board of Psychiatry and Neurology; Staff of the Jefferson Davis Hospital, Methodist Hospital, Hermann Hospital, Houston Tuberculosis Hospital, and Southern Pacific Hospital. 72 pages. J. B. Lippincott Co., Philadelphia, Pa., 1954. Price $3.

FLUID AND ELECTROLYTE THERAPY, by *Franklin L. Ashley,* M. S., M. D., Assistant Professor of Surgery, University of California Medical Center, Los Angeles, and *Horace G. Love,* M. D., Dallas, Tex. 72 pages; illustrated. J. B. Lippincott Co., Philadelphia, Pa., 1954. Price $3.

HYPERTENSION AND NEPHRITIS, by *Arthur M. Fishberg,* M. D., Director of Medicine, Beth Israel Hospital, New York; Clinical Professor of Medicine, Post-Graduate Medical School of New York University, New York, N. Y. 5th edition, enlarged and thoroughly revised. 986 pages; 49 illustrations. Lea & Febiger, Philadelphia, Pa., 1954. Price $12.50.

SEVENTY-FIVE YEARS OF MEDICAL PROGRESS, 1878-1953 (First Western Hemisphere Conference of the World Medical Association), edited and with a foreword by *Louis H. Bauer,* M. D., F. A. C. P., Secretary-General, The World Medical Association; Past President, American Medical Association; with 26 contributors. 286 pages. Lea & Febiger, Philadelphia, Pa., 1954. Price $4.

AN ATLAS OF CONGENITAL ANOMALIES OF THE HEART AND GREAT VESSELS, 2d edition, by *Jesse E. Edwards,* M. D., Consulting Physician in Section of Pathologic Anatomy, Mayo Clinic; Associate Professor of Pathologic Anatomy, Mayo Foundation for Medical Education and Research, Graduate School, University of Minnesota; *Thomas J. Dry,* M. A., M. B., Ch. B., M. S. in Medicine, F. A. C. P., Consulting Physician in Division of Medicine, Mayo Clinic; Professor of Medicine, Mayo Foundation for Medical Education and Research, Graduate School, University of Minnesota; *Robert L. Parker,* M. D., M. S. in Medicine, F. A. C. P., Consulting Physician in Division of Medicine, Mayo Clinic; Associate Professor of Medicine, Mayo Foundation for Medical Education and Research, Graduate School, University of Minnesota; *Howard B. Burchell,* M. D., Ph. D. in Medicine, Consulting Physician in Division of Medicine, Mayo Clinic; Professor of Medicine, Mayo Foundation for Medical Education and Research, Graduate School, University of Minnesota; *Earl H. Wood,* M. D., Ph. D. in Physiology, Consulting Physician in Section of Physiology, Mayo Clinic; Professor of Physiology, Mayo Foundation for Medical Education and Research, Graduate School, University of Minnesota; and *Arthur H. Bulbulian,* M. S., D. D. S., F. A. C. D., Director, Museum of Hygiene and Medicine, Mayo Foundation for Medical Education and Research, Graduate School, University of Minnesota. 216 pages; 491 illustrations, 32 in full color. Charles C Thomas, Publisher, Springfield, Ill., 1954. Price $13.50.

CLINICAL PSYCHIATRY, for practitioners and students, by *Ian Skottowe,* M. D. (Glasgow), M. R. C. P. (London), D. P. M. (London), Psychiatrist, Warneford and Park Hospitals, Oxford; Formerly Physician Superintendent, Bucks County Mental Hospital; Physician in charge, Department of Psychiatry, Royal Buckinghamshire Hospital, Aylesbury; and Examiner in Psychological Medicine, London University. 395 pages. McGraw-Hill Book Co., Inc., New York, N. Y., 1954. Price $8.75.

HISTOPATHOLOGY OF THE SKIN, by *Walter F. Lever,* M. D., Clinical Associate in Dermatology, Harvard Medical School; Assistant Dermatologist, Massachusetts General Hospital; Associate in Dermatology, Peter Bent Brigham Hospital; Consulting Dermatologist, Massachusetts Eye and Ear Infirmary, The Children's Hospital and Robert Breck Brigham Hospital. 2d edition. 518 pages; 281 illustrations with 8 in color. J. B. Lippincott Co., Philadelphia, Pa., 1954. Price $12.

PSYCHOPHYSIOLOGIC MEDICINE, by *Eugene Ziskind,* M. D., Clinical Professor of Psychiatry, University of Southern California School of Medicine; Head of Department of Psychiatry and Neurology, Cedars of Lebanon Hospital; Senior Attending Psychiatrist, Los Angeles County General Hospital. Foreword by *John C. Whitehorn,* M. D., Henry Phipps Professor of Psychiatry, The Johns Hopkins University; Psychiatrist-in-Chief, Johns Hopkins Hospital. 370 pages. Lea & Febiger, Philadelphia, Pa., 1954. Price $7.

THE YEAR BOOK OF PATHOLOGY AND CLINICAL PATHOLOGY (1953-1954 Year Book Series), edited by *William B. Wartman,* M. D., Morrison Professor of Pathology, Northwestern University; Director of Laboratories, Passavant Memorial Hospital; Senior Attending Pathologist, Wesley Memorial Hospital; Consulting Pathologist, Children's Memorial and Veterans Administration Research Hospitals, Chicago, Ill. 485 pages; illustrated. The Year Book Publishers, Inc., Chicago, Ill., 1954. Price $6.

HISTOLOGY, edited by *Roy O. Greep,* Ph. D., Dean and Professor of Dental Science, Harvard School of Dental Medicine; with 13 contributors. 953 pages; illustrated. The Blakiston Co., Inc., New York, N. Y., 1954. Price $15.

STUDIES IN SCHIZOPHRENIA, A Multidisciplinary Approach to Mind-Brain Relationships, by the *Tulane Department of Psychiatry and Neurology.* Reported by *Robert G. Heath,* Chairman. 619 pages; illustrated. Published for The Commonwealth Fund by the Harvard University Press, Cambridge, Mass., 1954. Price $8.50.

FIFTY YEARS OF MEDICINE, by *Lord Horder,* G. C. V. O., M. D., F. R. C. P. 70 pages. Philosophical Library, Inc., New York, N. Y., 1954. Price $2.50.

APPLIED ATOMIC ENERGY, by *K. Fearnside,* M. A., A. M. I. E. E.; *E. W. Jones,* B. Sc., A. Inst. P.; and *E. N. Shaw,* B. Sc. 156 pages; illustrated. Philosophical Library, Inc., New York, N. Y., 1954. Price $4.75.

LOW BACK PAIN AND SCIATICA, by *Louis T. Palumbo,* M. D., Des Moines, Iowa. 35 illustrations; 104 pages. J. B. Lippincott Co., Philadelphia, Pa., 1954. Price $3.

PARKINSONISM AND ITS TREATMENT, edited by *Lewis J. Doshay,* M. D., M. A., Ph. D., Department of Neurology, College of Physicians and Surgeons, Columbia University. 152 pages; illustrated. J. B. Lippincott Co., Philadelphia, Pa., 1954. Price $3.

A PRIMER OF PULMONARY FUNCTION, by *Harold Guyon Trimble,* M. D., and *James Kieran,* M. D., Oakland, Calif. 22 pages. Printed through the cooperation of California Tuberculosis and Health Association.

THE MICROTOMIST'S FORMULARY AND GUIDE, by *Peter Gray,* Ph. D., D. I. C., F. R. M. S., Head, Department of Biological Sciences, University of Pittsburgh. 794 pages; illustrated. The Blakiston Co., Inc., New York, N. Y., 1954. Price $10.50.

APHASIA THERAPEUTICS, by *Mary Coates Longerich,* Ph. D., and *Jean Bordeaux,* Ph. D. Forewords by *Harold Rosen,* Ph. D., M. D., and *Fred B. Moor,* M. D. 185 pages. The Macmillan Co., New York, N. Y., 1954. Price $3.75.

NATURE AND NURTURE: A MODERN SYNTHESIS, by *John L. Fuller,* Research Associate, Division of Behavior Studies, R. B. Jackson Memorial Laboratory, Bar Harbor, Maine. Doubleday Papers in Psychology, DPP 4, 40 pages. Doubleday and Co., Inc., Garden City, N. Y., 1954. Price $0.85.

GRENZ RAY THERAPY, Principles, Methods, Clinical Applications, by *Gustav Bucky,* M. D., Clinical Professor of Dermatology Emeritus, New York University, and *Frank C. Combes,* M. D., Professor of Dermatology and Syphilology, New York University Postgraduate Medical School, and Director of Dermatology and Syphilology, Bellevue Hospital. 204 pages; illustrated. Springer Publishing Co., Inc., New York, N. Y., 1954. Price $8.50.

PHYSICAL ASPECTS OF BETATRON THERAPY, by *John S. Laughlin,* Associate Professor of Biophysics, Cornell University Medical College, Sloan-Kettering Division, and Department of Physics, Memorial Center for Cancer and Allied Diseases, New York City; Formerly, Associate Professor of Radiology, University of Illinois College of Medicine, Chicago, Ill. American Lecture Series, Publication Number 196, A Monograph in American Lectures in Medical Physics. Edited by *Otto Glasser,* Ph. D., Department of Biophysics, Cleveland Clinic Foundation, Cleveland, Ohio. 98 pages; illustrated. Charles C Thomas, Publisher, Springfield, Ill., 1954. Price $3.75.

INTELLIGENCE, Statistical Conceptions of Its Nature, by *L. J. Bischof,* Associate Professor of Psychology, Southern Illinois University. Doubleday Papers in Psychology, DPP 5. 33 pages; illustrated. Doubleday and Co., Inc., Garden City, N. Y., June 1954. Price $0.85.

DEATHS

BEEBE, Douglas Monroe, Lieutenant Colonel, DC, USA; Walter Reed Army Medical Center and National Bureau of Standards, Washington, D. C.; graduated from Northwestern University Dental School in 1933; commissioned a first lieutenant in 1938; died 3 July 1954, age 47, at Walter Reed Army Hospital, of coronary thrombosis.

DAVIS, James Dean, Captain, MC, USAR, U. S. Army Hospital, Fort Jackson, S. C.; graduated from Howard University School of Medicine, Washington, D. C., in 1945; ordered to active duty 1 July 1953; died 6 June 1954, age 37, at Fort Jackson, of a cerebral hemorrhage.

KIRSCHENBAUM, David, Lieutenant Colonel, MC, USAR, U. S. Disciplinary Barracks, Camp Crowder, Mo.; graduated from New York University College of Medicine in 1927; ordered to active duty 1 July 1953; died 2 April 1954, age 49, at Neosho, Mo., of coronary occlusion with infarction of myocardium.

McDONALD, James Thompson, Jr., Lieutenant (MSC) USN, Bureau of Medicine and Surgery, Washington, D. C.; entered naval service in 1930; appointed warrant pharmacist in 1943; commissioned lieutenant in 1951; died 30 June 1954, age 44, at the U. S. Naval Hospital, Bethesda, Md., of hepatitis.

RADER, Herbert Talmadge, Major, MSC, USAR, Headquarters 9th Hospital Center, Landstuhl, Germany; graduated from Ohio State School of Law, Columbus, Ohio, in 1927; served during World War I; appointed a first lieutenant 13 September 1939; died in Germany 18 May 1954, age 55, of myocardial infarction.

VICTOR, Joseph, Lieutenant Colonel, MC, USAR; U. S. Army Hospital, Camp Detrick, Md.; graduated from the University of Rochester School of Medicine and Dentistry, in 1930; appointed a lieutenant colonel 11 February 1953 and ordered to active duty 13 March 1953; died 2 July 1954, age 48, at Walter Reed Army Hospital, Washington, D. C., of cancer.

ZOOBUCK, George Alfred, First Lieutenant, MSC, USA; Valley Forge Army Hospital, Phoenixville, Pa.; graduated from Trinity University, San Antonio, Tex., in 1949; entered military service 7 December 1943; commissioned a second lieutenant 19 October 1951; died 26 May 1954, age 34, in Phoenixville, of acute myocardial infarction.

MEDICAL REPRESENTATIVES FROM NATO COUNTRIES HOLD CONFERENCE AT SHAPE

More than 70 representatives of the medical profession from the 13 North Atlantic Treaty Organization countries attended the third Medical Planning Conference at Supreme Headquarters Allied Powers Europe, near Paris, on 10-12 May 1954.

The United States delegation from Washington, D. C., in a happy mood on their arrival in Paris on 8 May via MATS where they were met by Brigadier General William J. Kennard, USAF (MC), left, Chief of the Medical Branch, SHAPE, included: Major General George E. Armstrong, MC, USA, Assistant Secretary of Defense Frank B. Berry, William S. Middleton, M. D., Rear Admiral Lamont Pugh (MC) USN, and Major General Harry G. Armstrong, USAF (MC).

Presentations during the conference, which opened with an address by General Alfred M. Gruenther, USA, Supreme Allied Commander Europe, reviewed the progress made in planning logistic support for the medical requirements of NATO. Brigadier

First row, left to right: Maj. N. Gurhan, Turkey; Maj. Gen. George E. Armstrong, Surgeon General, U. S. Army; Maj. Gen. G. Ferri, Director General, Italian Army Medical Services; Col. R. Yetkin, Turkey; Maj. Gen. E. Akad, Surgeon General, Turkish Armed Forces; Air Marshal Sir James M. Kilpatrick, Director General, Medical Services, Royal Air Force; Maj. Gen. A. Sachs, Deputy Director, Medical Services, Eastern Command, United Kingdom; Surgeon Vice Admiral Sir Alexander Ingleby-Mackenzie, Medical Director General, Royal Navy Medical Services; Surgeon Rear Adm. R. C. May, Royal Navy, Medical Adviser to Commander in Chief, Allied Forces, Mediterranean; Maj. Gen. Harry G. Armstrong, USAF (MC); Maj. Gen. C. R. H. Fasting-Hansen, Director General, Danish Joint Medical Services; Maj. Gen. J. T. Wilkens, Director General, Royal Netherlands Army and Air Force Medical Service; Maj. Gen. F. F. R. Mans, Director General, Belgium Military Medical Services; Lt. Gen. G. Pera, Director General, Italian Air Force Medical Services; Maj. Gen. G. A. Hugonot, Director General, Central Directorate French Military Medical Services; Frank B. Berry, M. D., Assistant Secretary of Defense (Health and Medical); Rear Adm. Lamont Pugh, Surgeon General, U. S. Navy.

Second row, left to right: Maj. Gen. Dan C. Ogle, USAF (MC); Rear Adm. J. Galiacy, Deputy Director General (Navy), French Military Medical Services; Maj. S. Yagtug, Lt. Col. N. Ayanoglu, and Col. R. Erguder, Turkey; Brig. Gen. A. P. Da Rocha, Director, Medical Service, Portuguese Army; Maj. Gen. T. Dale, Director General, Norwegian Joint Medical Services; Dr. G. A. Clark, Principal Medical Officer, Ministry of Health, United Kingdom; Brig. K. A. Hunter, Director General, Medical Services, RCAMC; Brig. Gen. J. E. Brouwer, Director, Medical Services, Royal Netherlands Air Force; Maj. Gen. L. Guiso, Director General, Italian Naval Medical Services; Brig. E. M. Wansbrough, Director General, Canadian Dental Services; Air Commodore A. A. G. Corbet, Director General, Medical Services, RCAF; Wing Comdr. H. B. Hay, RCAF; Brig. Gen. P. R. Labarthe, Assistant Director General (Air Force), French Military Medical Services; Maj. P. Felten, Chief, Luxembourg Army Medical Service.

Third row, left to right: Brig. Gen. William J. Kennard, USAF (MC), SHAPE; Col. H. J. van der Giessen, Royal Netherlands Army Medical Service; Capt. Hubert J. Van Peenen (MC) USN, Staff Medical Officer, Atlantic Fleet; Capt. Dirk M. te Groen (MC) USN, Chief, Medical Branch, Hq Allied Forces, Southern Europe; Col. L. Udjus, Director, and Lt. Col. B. C. Paus, Norwegian Army Medical Service; William S. Middleton, M. D., Consultant to Assistant Secretary of Defense; Lt. Col. J. H. Stadelmann von Escholzmatt, Royal Netherlands Army Medical Services; Lt. Col. P. A. Costin, RCAMC; Col. G. A. Collin, French Military Medical Services; Lt. Col. J. G. Dickson, French Army; Maj. E. Evrard, Chief, Belgium Air Force Medical Services; Maj. R. E. L. Garbies, French Army Medical Service.

Fourth row, left to right: Surgeon Capt. M. Brun-Pedersen, Chief, Danish Royal Naval Medical Services; Capt. Cecil H. Coggins (MC) USN, SHAPE; Col. J. P. Douglas, RAMC, Hq Allied Forces, Northern Europe; Comdr. Sylvester R. Foley (MSC) USN, Hq Allied Command Atlantic; Surgeon Capt. E. H. Lee, Director General, Canadian Naval Medical Services; Surgeon Capt. C. B. Nicholson, Royal Naval Medical Services; Dr. J. A. MacFarlane, Chairman, Canadian Forces Medical Council; Col. J. H. J. Crosse, RAMC; Col. P. B. M. Vibin, Belgium; Lt. Col. P. P. Santini, France; Col. B. A. Duval, France; Col. M. L. M. Parent, France.

Fifth row, left to right: Maj. Charles C. Dugan, USAF (MC), Hq Allied Air Forces, Central Europe; Lt. Col. Sven A. Bach, MC, USA, Hq Allied Forces, Southern Europe; Col. Howard B. Nelson, USAF (MSC), SHAPE; Capt. Burrel W. Wingo, MSC, USAR; Dr. C. W. MacCharles, Canadian Defence Research Board; Col. J. Hempel-Jorgensen, Deputy Director, Danish Joint Medical Services; Maj. S. J. Seaman, RAMC; Group Capt. G. A. M. Knight, RAF; Col. T. M. R. Ahern, RAMC; Group Capt. J. R. Cellars, RAF; Col. Sheldon S. Brownton, USAF (MC), Executive Assistant to Dr. Berry; Brig. R. J. Rosie, RAMC; Surgeon Rear Adm. P. C. Broekhoff, Medical Director, and Surgeon Capt. W. A. Borgeld, Royal Netherlands Naval Medical Service; Col. K. H. Smith, Chief, Danish Air Force Medical Service.

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General William J. Kennard, USAF (MC), Chief of the Medical Branch, SHAPE, was general chairman of the meeting.

The following presentations were made by United States representatives: "Current Status of Antibiotics in the United States Armed Forces," Major General George E. Armstrong, Surgeon General, U. S. Army; "Health as the First Line of Defense,"* Rear Admiral Lamont Pugh, Surgeon General, U. S. Navy; "Emergency War Surgery," Brigadier General Sam F. Seeley, USA, Surgical Consultant, U. S. Army in Europe; "Report from Allied

Language barriers did not prevent an exchange of pleasantries as this group chatted between sessions. Left to right: Major General E. Ahad, Surgeon General of the Turkish Armed Forces, Colonel L. Udjus, Director of the Norwegian Army Medical Service, Captain Dirk M. te Groen (MC) USN, Major General Harry G. Armstrong, USAF (MC), and Major General G. Ferri, Director General of the Italian Army Medical Service.

Command Atlantic," Captain Hubert J. Van Peenen (MC) USN, Staff Medical Officer, Atlantic Fleet; and "The Problems of Medical Resupply for NATO Nations," Colonel Howard B. Nelson, USAF (MSC), Medical Branch, SHAPE.

Frank B. Berry, M. D., Assistant Secretary of Defense (Health and Medical) and Captain Dirk M. te Groen (MC) USN, Headquarters, Allied Southern Forces Europe, were among the discussion leaders on the first and second days of the conference, respec-

*To be published in the September issue.

tively. General Seeley's presentation constituted the progress report of the Committee of Consultant Surgeons of which he is chairman.

Before a background of NATO flags Lieutenant General Asim Ucar, left, Chief of Staff of the Turkish Air Force, chats with Surgeon Vice Admiral Sir Alexander Ingleby-Mackenzie, Medical Director General of the Royal Naval Medical Services, and Colonel J. Hempel-Jorgensen, Deputy Director of the Danish Joint Medical Services.

Other United States delegates to the meeting included: Major General Joseph I. Martin, MC, USA, Surgeon, U. S. Army in Europe; Major General Dan C. Ogle, USAF (MC), Surgeon, U. S. Air Forces, Europe; Major General Harry G. Armstrong, USAF (MC); Colonel Sheldon S. Brownton, USAF (MC); Lieutenant Commander Roy T. Brooks (MSC) USN; and Captain Burrel W.

Wingo, MSC, USAR, Washington, D. C.; William S. Middleton, M. D., Madison, Wis.; Captain Cecil H. Coggins (MC) USN, SHAPE; Lieutenant Colonel Sven A. Bach, MC, USA, Head-

Another group scans one of the many documents under study during the conference. From left to right: Brigadier K. A. Hunter, Director General of Medical Services, Royal Canadian Army Medical Corps; Air Commodore A. A. G. Corbet, Director General of Medical Services, Royal Canadian Air Force; Major P. Felten, Chief, Luxembourg Army Medical Service; and Lieutenant Colonel Sven A. Bach, MC, USA, Hq. Allied Forces Southern Europe.

quarters Allied Forces Southern Europe; Commander Sylvester R. Foley (MSC) USN, Headquarters Allied Command Atlantic; and Major Charles C. Dugan, USAF (MC), Headquarters Allied Forces Central Europe.

BOOK REVIEWS

A MANUAL OF TROPICAL MEDICINE, by *Thomas T. Mackie,* M. D., Colonel, MC, AUS (Ret.); *George W. Hunter, III,* Ph. D., Colonel, MSC, USA; and *C. Brooke Worth,* M. D., 2d edition. 907 pages; 304 illustrations, 7 in color. W. B. Saunders Co., Philadelphia, Pa., 1954. Price $12.

This popular volume has been largely rewritten, greatly extended in scope, and otherwise thoroughly revised so as to present the most recent information in the field. The approach and format remain essentially the same and this is commendable. The book continues to serve as a ready resumé of the salient features of the epidemiology, diagnosis, treatment, prevention, and control of what the authors deem the more important tropical diseases. The recommended therapeutic measures and methods of control of vectors and reservoirs are up to date. The manual is prepared, indexed, and cross-indexed in such a manner that it is easy to locate desired information. There is a particularly useful section of 50 pages on laboratory diagnostic procedures, and the concise summary on drug therapy of helminthic infections is most welcome.

It is unfortunate that the authors found it necessary to delete both specific documentation and a general bibliography, although a list of important texts is included. It thereby is impossible to determine the source of such controversial statements as "Transmission of murine typhus from man to man by the body louse * * * has been demonstrated."

The authors wisely point out the need for discussion of diseases which are not limited to the tropics and have interpreted the historical term "tropical medicine" as in actuality meaning "exotic medicine." This is obviously the basis for a sound presentation on Korean epidemic hemorrhagic fever, although no mention is made of the viral and nonviral "hemorrhagic fevers" of the Soviet Union. At times there seems to be a disproportionate emphasis of relatively minor matters to the exclusion or limitation of material of greater interest to workers in tropical medicine.

This book presents in readily accessible form much valuable data, and the illustrations, tables, and charts on the whole are excellent. Some of the information so graphically presented is not generally available, as in the case of the excellent table on tick vectors of the spirochetes of relapsing fever. It is an extremely useful book and one which will be relied on by military and civilian scientists in the warmer climates. — *ROBERT TRAUB, Lt. Col., MSC, USA*

AN INTRODUCTION TO CLINICAL PSYCHOLOGY, edited by *L. A. Pennington,* Ph. D., and *Irwin A. Berg,* Ph. D. 2d edition. 709 pages; illustrated. The Ronald Press Company, New York, N. Y., 1954. Price $6.50.

This useful work is a revision of a compendium on clinical psychology first published in 1948. It has been rewritten and brought up-to-date. Several new chapters have been added and old ones dropped, but many of the original writers have been retained. Extended discussion has been provided for therapy and research, but the separate chapter on somatic therapies has been omitted. The purpose of the volume is to inform and inspire novice clinical psychologists and to provide interested specialists in associated disciplines with orientation on theories and practices in this science.

The editors disclaim any definitive point of view, even the eclectic; nevertheless, psychoanalytic concepts permeate the theoretic material of many chapters and provide the rationale for diagnostic instrumentalities as well as research hypotheses. The attitude toward tests, particularly the unvalidated or projective types, is conservative, with emphasis on evaluation through experimental methods as well as controlled empiricism. The expanded treatment of psychotherapy is noteworthy, and parallels the increase in magnification of this function in clinical psychology since the date of the first edition. The chapters by Wilkins and McKinney in this area are exemplary of the clarity and succinctness demanded in the exposition of conceptually difficult or intricate material. Emphasis on problems and hypotheses rather than on discrete cues or devices features the clinical approach sanctioned by the present edition.

The book may well realize the expectations of the editors in stimulating and enlightening the beginning clinical worker as well as engendering understanding and regard for clinical psychology among adjunct scientists. It will also prove of value to the more experienced worker as a reference text on the fundamentals of his profession. The chapter bibliographies, together with the index of names, form a convenient system for either immediate or delayed reference.

—*ARTHUR J. ORANGE, Lt. Col., MSC, USA*

PREVENTIVE DENTISTRY, by *Joseph C. Muhler,* D. D. S., Ph. D.; *Maynard K. Hine;* D. D. S., M. S.; and *Harry G. Day,* Sc. D. 336 pages; 56 illustrations. The C. V. Mosby Co., St. Louis, Mo., 1954. Price $8.50.

This textbook should achieve fully its stated objective to provide "useful information on developments in those fields of science which contribute to preventive dentistry." It has thirteen chapters. The first discusses the modern problem of oral disease and the essential need for preventive and educational measures in solving this problem. Seven chapters are concerned with preventive considerations which relate to dental caries, including caries diagnosis, caries activity tests, immunization to caries, and an important evaluation on fluorine and caries.

Instructive discussions are included on the influence of specific agents such as bacteriostatic drugs, impregnation solutions, the nitrofurans, and vitamin K. The remaining five chapters cover nutrition, a survey of dental histology, pathology and calcification, the dynamics of tooth tissues, the prevention of periodontal disease, and the prevention of fatalities from oral cancer.

The authors have included many direct quotations from a total of 569 authors. This rather exhaustive use of the literature has been integrated effectively to produce an instructive, readable, and interesting textbook. Nearly every chapter has a concise summary, and each ends with a full list of its reference articles. The book, therefore, is of value both to readers who wish only to determine gross conclusions and to those who may desire to make a complete study of the chapter subject. Numerous tables and illustrations are included, and indexing is complete with separate indexes by author and subject.

The reader who expects this book to provide definitive programs for preventive dentistry may be slightly disappointed. No fully co-ordinated program is presented. Also, no material has been included on preventive dentistry possibilities in the specialties of prosthodontia, oral surgery, and orthodontia. It is a well-written and instructive book which will prove valuable to all who are interested in the development of effective preventive dentistry.—*KENNETH R. ELWELL, Lt. Col., USAF (DC)*

CARCINOMA OF THE COLON, by *Leland S. McKittrick,* M. D., and *Frank C. Wheelock,* Jr., M. D. 94 pages; illustrated. Charles C Thomas, Publisher, Springfield, Ill., 1954. Price $3.25.

This small monograph is a rather complete treatise on carcinoma of the colon, exclusive of the rectum. The authors have had wide experience and present their material in the conventional manner, beginning with the causes of the disease and continuing with the prevention, diagnosis, pathology, anatomy, treatment, operative technic, postoperative care, and end results, including benign adenomatous polyps.

There are many outstanding features of the book; for example, the description of symptoms of cancer of the colon. One excellent statement pertinent to armed forces physicians, is worth quoting: "It is a great mistake to associate age with diagnosis of cancer. The symptoms of cancer are the same regardless of age and demand the same consideration in the young as in the old."

Much of the empirical ritual of surgical technic of the preneomycine bowel sterilization era is faithfully preserved and described. The cautery is still brandished, and elaborate field and instrument quarantine procedures recommended.

Carcinoma of the colon is sufficiently common and important to justify publication of this monograph, despite the lack of new or original material.—*ROALD N. GRANT, Comdr. (MC) USN*

NEUROSURGERY OF INFANCY AND CHILDHOOD, by *Franc D. Ingraham*, M. D. 456 pages; 482 illustrations. Charles C Thomas, Publisher, Springfield, Ill., 1954. Price $15.

This is probably the first textbook of pediatric neurosurgery, and is composed of an organized collection of reports from the Children's Medical Center in Boston. With the increase in neurosurgeons throughout the country, more children will be treated locally, by men not entirely familiar with the problem of the pediatric patient. This book may help to prevent some of the mistakes attributable to the peculiarities of children.

The book is divided into 10 parts. The first and second, dealing with congenital abnormalities and hydrocephalus, are excellent. These are problems most frequently encountered in children. Part three on trauma is helpful in the practical aspects of handling a patient. Parts four and five on tumors of the brain and the spinal cord are interesting and describe large series. Part six, on infection; part seven, on cerebral vascular disorders; and part eight, on epilepsy, are brief and to the point but not particularly enlightening. The ninth part on lead encephalopathy is good. The final section, on pediatric neurosurgical anesthesia, could be enlarged and should include pre- and post-operative care even at the expense of repeating some of the practical hints given elsewhere throughout the volume.

This book is valuable both as a reference and as a guide. It is definitely worth having, and one which will undoubtedly go through several editions.—*FRANK B. CLARE, Lt. Comdr. (MC) USN*

THORACIC SURGERY, by *Richard H. Sweet*, M. D. 2d edition. 381 pages; illustrated. W. B. Saunders Co., Philadelphia, Pa., 1954. Price $10.

In the second edition of this excellent work on the technic of thoracic and other related operations, the author has purposely omitted discussion of the pathophysiology of the conditions for which operations are described.

The print is larger and much easier to read than in the first edition, and numerous minor changes have been made in the subject matter as well as in the illustrations. The book contains 11 chapters with 159 illustrations and describes every type of operation within the chest as well as thoracicoabdominal and thoracocervical operations. Only 33 pages are devoted to cardiovascular surgery, but all of the accepted operative procedures in this field are described as well as most operations in the experimental or unproved stage. The author states that pulmonary and mitral valvotomy are now established procedures. The two chapters on the esophagus, a subject in which the author is particularly qualified, are outstanding. Although there is no bibliography, the book is well indexed.

This book belongs in the hands of all thoracic surgeons, trainees in this specialty, and the general surgeon who occasionally must perform a thoracic operation.—*SANFORD W. FRENCH, III, Col., MC, USA*

CHILD HEALTH AND THE STATE, by *Alan Moncrieff*, M. D. 48 pages. Oxford University Press, New York, N. Y., 1953. Price $1.50.

This small volume contains the Newsholme Lectures for 1953 on infant welfare, school health, the deprived child, and parental responsibility and the state. It is a scholarly treatise dealing with the omnipresent problems of child health and general welfare, with particular reference to the duties and responsibilities of the State under current statutes in Britain. The author points with pride to the great advances made in child health in Britain in recent years, but at the same time points out the shortcomings of the program. He lists the advantages, disadvantages, and weaknesses in the current approach to the problem and emphasizes the areas to which greater attention should be focused.

—*LUCIUS G. THOMAS, Col., MC, USA*

JOSEPH BARCROFT, 1872-1947, by *Kenneth J. Franklin*. 381 pages; illustrated. Charles C Thomas, Publisher, Springfield, Ill., 1953. Price $8.50.

This book gives one the pleasure of becoming intimately acquainted with that extraordinary man, Sir Joseph Barcroft, teacher, scholar, and scientist. Franklin gives the reader the impression that even though personal sacrifices were required to write this biography, he nevertheless considers writing it one of the most fortunate circumstances of his life.

This reviewer had for several years read the scientific publications of Sir Joseph with delight and instruction, and with the highest regard for their author. Now after reading his biography, I am even more convinced of the man's greatness. In his scientific lifetime, Barcroft wrote or participated in some 318 publications, which are listed in order of their appearance.

The book begins with an introduction which includes an interesting historical background of the Barcroft family. The remainder of the book is a moving account of Barcroft's education, teaching, research, travels, and his family. In his lifetime Barcroft was associated with such great men as A. V. Hill, Lewis, Starling, von Frey, Krogh, Pavlov, Haldane, Bayliss, Dale, and many more.

Franklin uses imagination in presenting his material clearly and convincingly, and holds the reader's interest throughout his presentation. He recreates the essential character of Barcroft, and from the various facts is able to make his readers see and understand Barcroft. Barcroft never lost his gaiety or sense of humor, nor neglected the religious side of his life. It is amusing to note his power of mimicry, and that his repertoire included an imitation of a speech by Pavlov.

The book is richly illustrated with original photographs, which add to its readability, and is recommended for lay and professional people alike.—*EUGENE B. KONECCI, First Lt., USAF (MSC)*

THE YEAR BOOK OF UROLOGY, edited by *William Wallace Scott,* M. D., Ph. D. 375 pages; illustrated. The Year Book Publishers, Inc., Chicago, Ill., 1954. Price $6.

The literature of interest to urologists from journals received between November 1952 and October 1953 is reviewed in the annual volume. The editor has made an excellent selection of articles which have been abstracted succinctly and, in many instances, are followed by valuable supplemental information. These latter data include ideas of many authors as well as additional references on the subject, and the plan is commendable as well as informative.

The subject matter is covered under seven general headings: general considerations, the kidney (including a valuable section on physiology), the adrenals, ureter, bladder, prostate, and genitalia. The detailed comment, including therapy with exact dosages of medications used, makes this book a valuable reference. The illustrations selected are the most pertinent in the articles and are a valuable adjunct to the reports.

Of special interest to urologic surgeons in the military service are the sections on infections and on the genitalia. Our thinking and practice on the former subject are beautifully summarized and, in the latter section, the subject of testicular tumors is again emphasized and summarized. The book has a splendid index both by subject and by author which is of great assistance in using it as a reference.

—EARL C. LOWRY, Col., MC, USA

CLINICAL NEUROLOGY, by *Bernard J. Alpers,* M. D., Sc. D. 3d edition. 880 pages; 243 illustrations. F. A. Davis Co., Philadelphia, Pa., 1954.

Indicative of its popularity, this is the sixth printing and the third edition of this book that has appeared in nine years. The author describes his purpose as the presentation of subject of neurology in such a manner as to make it intelligible to medical students and general practitioners, and includes a detailed account of all the neurologic conditions encountered in practice. Many subjects have been revised to incorporate advanced knowledge. The volume is not too large, the printing is easy to read, and the subjects are arranged in a logical and sequential order. A particularly valuable and unusual inclusion is the chapter, "The Topical Diagnosis of Nervous Disease," which contains an excellent review of neurophysiology. There also is included a complete section on diseases of the peripheral nervous system, which is all too frequently omitted in a textbook of this type. The book is well written and easily understood, the language employed is neither stilted nor pedantic. There are abundant and good illustrations, but in a reference book of this type a bibliography would be most useful.

In spite of a few typographical errors and the absence of a bibliography, this is an excellent book and should be a valuable addition to the library of the neurologist. It is recommended, as well, for all students and general practitioners.—*HENRY S. COLONY, Comdr. (MC) USN*

THE PATHOLOGY OF TRAUMA, by *Alan Richards Moritz*, M. D. 2d edition. 414 pages, enlarged and thoroughly revised; with 126 illustrations. Lea & Febiger, Philadelphia, Pa., 1954. Price $8.50.

This edition brings up to date a book which should be available to every medical officer. Its comprehensive coverage of nearly all forms of mechanical injury makes it an invaluable reference to the pathologist, surgeon, neurologist, and internist in evaluating the medicolegal and compensatory aspects of injury. Its succinct systematic approach to the subject and clarity of presentation make for easy reading and rapid comprehension.

Because the author confines his remarks to trauma, the harried medical officer will find no help in solving problems where toxicologic aspects may be a factor, and it is believed that a brief discussion of this field would increase greatly the value of this volume. Discussion of injury due to radiant energy is brief and is the only shortcoming of a book dealing so comprehensively with trauma. Of particular value is a chapter dealing with the medicolegal autopsy which should serve as a guide to any physician who might be required to perform this function. Outstanding authorities assisted in the preparation of this book. An extensive bibliography and adequate index are included.

—*FRANK A. MANTZ, Jr., Lt. Col., MC, USA*

DIE ZEREBRALE ANGIOGRAPHIE, by *Hugo Krayenbühl*, Professor of Neurosurgery, Zurich, Switzerland; and *Hs. R. Richter*. 217 pages; 100 illustrations. Georg Thieme Verlag, Stuttgart, Germany, 1952.

Since the invention of carotid arteriography by Moniz in 1927, increasingly more cerebral arterial and venous angiograms have been made in neurologic clinics all over the world, while the frequency of pneumographic studies of the brain has declined correspondingly. Each type of neuroradiologic examination has its definite role, and angiography supplements but does not supplant other diagnostic technics.

European neurologists and neurosurgeons preceded their American confreres in widespread adoption of cerebral angiography in clinical practice. Krayenbühl was able to select illustrations for *Die zerebrale Angiographie* from more than 1,500 angiographic examinations performed on his neurosurgical service at Zurich.

Technics, characteristic vascular patterns, and other details of intracranial angiography are discussed in practical fashion, but it is in the clear-cut photographic presentation of actual angiograms, normal and pathologic, that the greatest value of this volume lies. Accompanying artist's sketches point up significant roentgenographic findings.

Die zerebrale Angiographie is an interesting and informative monograph which should be in the possession of every neurologist and neurosurgeon, and will be a handbook of ready and valuable reference in radiologic libraries. The illustrations, format, and print are attractive and readable. The text is in German. —*JAMES P. MURPHY, M. D.*

ANTISEPTICS, DISINFECTANTS, FUNGICIDES, AND CHEMICAL AND PHYSICAL STERILIZATION, edited by *George F. Reddish*, Ph. D. 841 pages; 71 illustrations; 130 tables. Lea & Febiger, Philadelphia, Pa., 1954. Price $15.

The combined efforts of 30 contributors are assembled in this book to form a comprehensive source of pertinent information. It is arranged in an orderly manner, with a complete list of references for each chapter.

The book begins with a historical review of the field, and definitions of terms to be used. Part II deals with methods of testing, beginning with a review of early methods of testing germicides and continuing through improved test methods, phenolic disinfectants, chlorine compounds, quaternary ammonium compounds, proposed new methods for testing liquid antiseptics, toxicity tests, *in vivo* tests, profile evaluation of antiseptics, mercurials, and chemical sterilization. Separate chapters give detailed descriptions of various methods of testing antiseptics, disinfectants, fungicides, and fungistats, and methods of testing chemical sterilizers and tests for sterility. The discussion of bacterial resistance and dynamics of antibacterial activity is excellent.

Many specific chemicals and compounds are reviewed as to their relative effectiveness, as well as various classes of preparations, such as surgical antiseptics, antiseptic ointments and powders, and virucidal agents. Industrial preservatives are discussed, especially in their application to food, wood, cotton, pulp and paper, pharmaceuticals and cosmetics, leather, paint, and optical instruments. The concluding chapters deal with various methods of sterilization, including a detailed explanation of the use of ionizing radiations.

This should prove a valuable book for anyone interested professionally in any phase of the subject.

—*RUSSELL L. TAYLOR, Comdr. (MSC) USN*

UNDERSTANDING THE JAPANESE MIND, by *James Clark Moloney*, M. D. 252 pages. Philosophical Library, Inc., New York, N. Y., 1954. Price $3.50.

In attempting to explain individual and collective Japanese behavior through a study of Japanese culture the author has drawn together material of general as well as professional interest. His sources include works on anthropology, history, sociology and religion, translations of Japanese psychoanalytic papers, and personal conversations and correspondence with Japanese psychoanalysts. The essential question raised is whether or not the unique Japanese psychosocial institutions make it possible for Japanese psychoanalysts to free the patient from the irrational, unconscious forces in his personality which prevent him from being an individual in his own right. He believes that the ancient social and political customs demand that a person be merely a kind of molecule in the national body and exist only for the greater glory of Japan.

To quote Doctor Moloney: "..... at birth a person is expected to become nothing at all (*mimpi*). He is directed to respect authority (*kanzan*). He is trained to obligate himself obsequiously to the father (*ko*) or to any father or parent substitute (*oya bun*), or to the emperor (*chu*), or the emperor's way (*kodo*). He is required to become a god (*kami*), or to fulfill the way of the gods (*shinto*). As a Japanese, he is respectful of his own level in society and of that of his associates (*enryo*) and obedient to his guild (*shokunin katagi*). He must lose his individuality to save face (*sekentei*). He ceases to be an individual, performing *giri* (an elaborate institution requiring him to behave in a prescribed fashion expressive of his nationalism) to his empire, and doing that which is expected of him (*jicho*)." With few exceptions, the author believes that Japanese psychoanalysts have merely imitated the *technic* of psychoanalysis without integrating its spirit.

Among the interesting observations in Japanese psychiatry, as distinguished from Japanese psychoanalysis, is that Japanese men, even when insane, conform to authority, while it is not uncommon for disturbed women patients to behave in a manner which is popularly associwith the concept of insanity. This contrasting behavior is explained in part by the fact that from birth males are subject to more rigid indoctrination toward respect for authority.

The book has an index and many useful references.

—*WARREN J. BARKER, Lt. Col., MC, USA*

A PRIMER OF CONGESTIVE HEART FAILURE, by *George E. Burch*, M. D. 126 pages; illustrated. Charles C Thomas, Publisher, Springfield, Ill., 1954. Price $4.

This monograph consists of four chapters concerning: mechanism of congestive failure, its treatment, digitalis, and mercurial diuretics.

The chapter on the mechanism of congestive failure which critically reviews the several theories and factors involved in its production is excellent. The author examines each facet of the subject separately while maintaining an awareness that the whole problem thus far has defied satisfactory explanation. In emphasizing fundamental and known principles, the author's discussion of the overuse of mercurial diuretics, particularly intravenously, and his remarks on hyponatremia are conservative.

Considerable detail on various digitalis preparations is given, including dosage, speed of action, elimination, and potency. The discussion on the action of digitalis is somewhat brief and could be extended in future editions. The chapter dealing with mercurial diuretics presents a large mass of details without the clear and cohesive exposition demonstrated in the first chapter.

This is a worth-while monograph on a complex problem. It is recommended reading for the young graduate in medicine and the general practitioner, and is a good review for internists.

—*THOMAS W. INMON, Lt. Col., MC, USA*

DERMATOLOGIC MEDICATIONS, by *Marguerite Rush Lerner*, M. D., and *Aaron Bunsen Lerner*, M. D., Ph. D. 183 pages; illustrated. The Year Book Publishers, Inc., Chicago, Ill., 1954. Price $3.50.

In a concise, comprehensive, easy-to-use handbook, the authors present a compilation of the commonly used and most effective dermatotherapeutic agents. Under each agent is given the chemical structure, indications for its use, mode of action, dose or method of application, and side effects. The agents are grouped together according to their use or action (for example, chemotherapeutic agents, antihistamines, fungicidal and fungistatic agents, and seborrheic dermatitis preparations), and are indexed both by the name of the agent and by the disease for which it is useful. The last 30 pages of the book concern therapy regimens for the more common conditions requiring progressional types of treatment. Included in this section are such entities as acne vulgaris, eczematous dermatitis, psoriasis, and lupus erythematosus.

This is an excellent presentation and one particularly suited for the resident in dermatology, as well as for the physician who has not specialized in the field of dermatology.—*RAYMOND M. WILLIAMS, Col., MC, USA*

METHOD AND THEORY IN EXPERIMENTAL PSYCHOLOGY, by *Charles E. Osgood*. 800 pages; illustrated. Oxford University Press, New York, N. Y., 1953. Price $10.

This book, written primarily for use as a text by undergraduate and graduate students in psychology, is divided into four main sections. Part I deals with sensory processes, of which auditory and visual modalities receive the most comprehensive treatment; part II discusses perceptual processes in terms of perceptual organization, projection dynamics, and central dynamics; part III is devoted to the literature on learning, retention, and transfer; and part IV deals with symbolic processes under such subheadings as "Problem Solving and Insight," "Thinking," and "Language Behavior." The remainder of the book consists of bibliography and indexes.

Rather than indulge in an exhaustive coverage of the field, the author has preferred to emphasize the appraisal of selected experimental materials in relation to "critical theoretic issues." For this purpose the coverage is reasonably extensive, but the book's general usefulness as a text and reference may have been rendered somewhat limited by such preferential treatment. For example, audition and vision are discussed comprehensively, but other modalities receive little more than token attention in a chapter on "sensory quality." Similarly, the devotion of more than one third of the volume to learning and memorial processes may leave the reader uninformed about the whole experimental field. Occasionally, even more extensive coverage of some topic omits important contributions. For example, a discussion of motor activity in relation to thought processes ignores the important work of R. C. Davis. It is difficult to imagine a reason for such an oversight.

The author's style of composition is bright and fluid, and he succeeds admirably in stimulating the reader's critical thinking by the clever insertion of questions and speculative asides. Illustrations are freely used, clearly presented, and carefully explained. The format and typography are superior. This is a book well worth owning.

—*ROBERT B. PAYNE, Maj., USAF (MSC)*

CLINICAL ORTHOPTIC PROCEDURE, by *William Smith*, O. D. 2d edition. 524 pages; 91 illustrations. The C. V. Mosby Co., St. Louis, Mo., 1954. Price $10.

By revision, correction of errors, and additions, the author has improved this book into a readable treatise on orthoptics. Throughout it, however, he uses many terms that have different meanings for the optometrist and the ophthalmologist; this ambiguity makes it difficult to understand his intent. A glossary partly compensates for this.

The chapter on orthoptic instruments, including a brief resumé of their uses, is excellent and is well illustrated. The coverage of the many orthoptic tests, their uses, and advantages is adequate and clear.

The author indicates that orthoptics should be started at an early age, and discusses many ingenious ways of gaining a child's full cooperation. I agree that an early age is the ideal time to begin such treatment, but nevertheless it is generally accepted among ophthalmologists that orthoptics in a very young child is usually time lost, and often leads to resentment which make later successful training difficult or even impossible.

The author has attempted to produce a volume which is all inclusive and useful both for the student and novice, and for the seasoned practitioner. It can be used to a limited extent as a reference book by the well-trained ophthalmologist and the experienced orthoptist, but it cannot be recommended for the student and the novice, lest they develop ideas which will surely lead to many future disappointments.

—*HORACE W. SHRECK, Lt. Col., MC, USA*

MAN IN SOCIETY, by *George Simpson*. 90 pages. Doubleday & Co., Inc., Garden City, N. Y., 1954. Price $0.95.

This small book, as a "preface to sociology and the social sciences," is concerned with sociology as a science, and with its evolution, methods, personnel, problems, future, and interrelations with other sciences. Written as a preface to a new series titled "Doubleday Short Studies in Sociology," it brings together a rather remarkable current panorama of sociology and the social sciences, and does it so well that even the neophyte can read and understand many of the very basic problems facing social science today.

The mature reader, though a bit more skeptical about the level of altruism ascribed to those working in this field, the significance of their achievements, and the optimistic picture the author paints of the

future, may still accept the efforts of these scientists as scientifically valid and worth while.

The volume has little value for the researcher in the medical service of the armed forces, but should serve its purpose rather well; namely as a preface to this series and as a stimulating and provocative introduction to sociology and the other social sciences.

—*BLAIR W. SPARKS, Capt., USAF (MSC)*

CURRENT THERAPY 1954, edited by *Howard F. Conn*, M. D. 898 pages. W. B. Saunders Co., Philadelphia, Pa., 1954. Price $11.

This is the sixth edition of an annual publication designed to bring to the physician authoritative, current methods of treatment in a readily available form. It is limited to therapy and no diagnostic discussions are included. The discussions are written by 385 well-qualified contributors actively engaged in treating the diseases of which they write and evaluating the drugs described.

The inclusion of recent advances in therapy as well as long-tested therapeutic regimens provides the reader with a balanced viewpoint of the present-day approach to the therapeutic management of the patient. In many instances more than one method are presented for the treatment of a specific disease representing different views of therapy or different conceptions of the disease.

This volume is highly recommended as a ready reference for the busy practitioner.— *JOHN T. B. STRODE, Col., MC, USA*

PRINCIPLES OF BIOCHEMISTRY, A Biological Approach, by *M. V. Tracey*, M. A. 194 pages; illustrated. Pitman Publishing Corp., New York, N. Y., 1954. Price $4.

This book re-emphasizes that biochemistry is a biologic science and must be considered from the point of view of the cell and its environment. It is divided into three parts. The first concerns the biochemical organization of the cell and the systems which support the life of the cell; the second discusses the cell in its environment and the systems which enable it to adjust to this environment; and the third deals with those factors which are the cause or result of the differentiation between animal, plant, and micro-organism. The author continually stresses the similarity between the three major categories of living systems.

The volume is small and the subject is large. Only the major highlights are brought out and the fine detail or fact or the support of controversial statements is left to the reader to obtain. A more extensive bibliography, particularly in reference to main subject headings, would have been helpful— *IRVING GRAY, Lt. Col., MSC, USA*

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